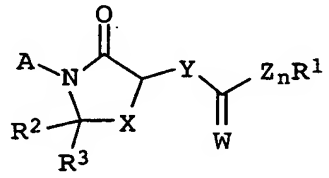
1-Phenylpyrrolidine-2-one-3-carboxamides

The present invention relates to 1-phenylpyrrolidin-2-one-3-carboxamides and their agriculturally useful salts, to compositions comprising such compounds and to the use of the 1-phenylpyrrolidin-2-one-3-carboxamides, of their salts or of compositions comprising them as herbicides.

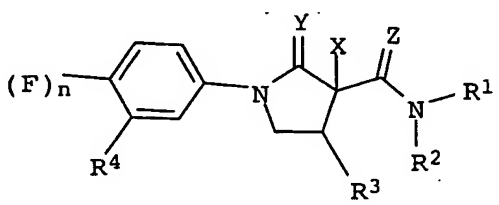
WO 95/33719 describes 1-arylthiazolidinones, 1-aryloxazolidinones and 1-arylpyrrolidinones of the formula:



where A is an aromatic or heteroaromatic radical, n is 0 or 1, X is in particular S, O or CH_2, Y is in particular S, O, CH_2 or $CH(CH_3)$ or a group NR^6, Z is in particular NH or O, R^1 is preferably selected from unsubstituted or substituted alkyl, alkenyl, alkynyl, unsubstituted or substituted cycloalkyl, unsubstituted or substituted phenyl, benzyl or hetaryl, acyl, alkoxycarbonylalkyl and silyl, R^2 and R^3 are in particular hydrogen and R^6 is inter alia hydrogen, formyl, unsubstituted or substituted alkyl, alkenyl, alkynyl, cycloalkyl or unsubstituted or substituted aryl.

WO 95/33718 describes 1-phenylpyrrolidinethiones having herbicidal activity which, in the 3-position of the pyrrolidinethione ring, contain a group $O-C(O)-NR^1R^2$ where R^1R^2 are, for example, hydrogen, an unsubstituted or substituted hydrocarbon radical or hetaryl, or together with the nitrogen atom to which they are attached form a heterocycle.

Furthermore, US 4,874,422 discloses herbicidally active 1-phenylpyrrolidin-2-one-3-carboxamides of the formula A



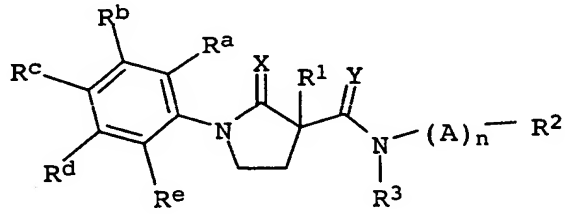
(A)

where X is hydrogen or halogen, Y and Z independently of one another are O or S, n is 0 or 1, R^1 is hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, alkoxy, phenyl, halophenyl, benzyl, halobenzyl, or alkyl which is substituted by alkoxy, alkylthio, phenyl, hydroxyl or cyano, R^2 is hydrogen or alkyl, R^3 is alkyl or alkenyl and R^4 is selected from the group consisting of hydrogen, halogen, methyl, trifluoromethyl, 1,1,2,2-tetrafluoroethyl, 1,1,2,2-tetrafluoroethyloxy, difluoromethoxy, trifluoromethoxy, methylsulfanyl, methylsulfinyl, methylsulfonyl, methoxyiminomethyl, methoxyimino-1-ethyl, benzyloxyiminomethyl and benzyloxyimino-1-ethyl.

The herbicidal activity of the 1-arylpyrrolidinones described in the prior art is not always satisfactory. Their selectivity for harmful plants is unsatisfactory, too. In particular, even at low application rates, such herbicides tend to interfere with the generation of chlorophyll even in crop plants, which is undesirable in principle and may lead to yield losses.

It is an object of the present invention to provide novel herbicidally active compounds which allow a better targeted control of unwanted plants than the known herbicides. Advantageously, the novel herbicides should be highly active against harmful plants. Moreover, high compatibility with crop plants is desirable. Moreover, the compounds should have no adverse effect on the chlorophyll synthesis in crop plants.

We have found that this object is achieved by 1-phenylpyrrolidin-2-one-3-carboxamides of the formula I defined below and their agriculturally useful salts:



(I)

where the variables R^1, R^2, R^3, X, Y, A, n, R^a, R^b, R^c, R^d and R^e are as defined below:

R^1 is hydrogen, OH, Cl, Br, C_1-C_6-alkyl, C_3-C_6-cycloalkyl, C_3-C_6-alkenyl, C_3-C_6-alkynyl, $C(O)R^4$ or $OC(O)R^4$;

R^2 and R^3 independently of one another are hydrogen, C_1-C_{10}-alkyl, C_3-C_{10}-cycloalkyl, C_7-C_{10}-polycycloalkyl, C_3-C_8-alkenyl, C_3-C_{10}-alkynyl, C_5-C_{10}-cycloalkenyl, C_3-C_8-cycloalkyl-

C_1-C_4-alkyl, phenyl or 3- to 7-membered heterocyclyl, where the 9 last-mentioned groups may be unsubstituted, partially or fully halogenated and/or contain 1, 2 or 3 radicals selected from the group consisting of OH, CN, NO_2, COOH, C_1-C_6-alkyl, C_1-C_6-haloalkyl, C_1-C_6-alkoxy, C_1-C_4-haloalkoxy, C_2-C_6-alkenyl, C_2-C_6-alkynyl, C_1-C_6-alkylthio, C_1-C_4-haloalkylthio, unsubstituted or substituted phenyl, $COOR^5$, NR^6R^7, $C(O)NR^8SO_2R^{13}$, $C(O)NR^8R^9$ and 3- to 7-membered heterocyclyl, and each heterocyclyl may contain 1, 2 or 3 heteroatoms selected from the group consisting of oxygen, nitrogen, sulfur, a group NR^{10} and a group SO_2, and, if appropriate, 1, 2 or 3 carbonyl groups and/or thiocarbonyl groups as ring members; and/or may contain a ring-fused phenyl ring which is unsubstituted or substituted; or

R^2 and R^3 with the group $N-(A)_n$ to which they are attached form a saturated 3- to 7-membered heterocycle which, in addition to the nitrogen atom, may contain 1, 2 or a further 3 heteroatoms selected from the group consisting of oxygen, nitrogen, sulfur and a group NR^{10} and, if appropriate, 1, 2 or 3 carbonyl groups and/or thiocarbonyl groups as ring members;

R^a, R^b, R^c, R^d and R^e independently of one another are hydrogen, OH, CN, NO_2, halogen, C_1-C_{10}-alkyl, C_3-C_6-cycloalkyl, C_2-C_6-alkenyl, C_2-C_6-alkynyl, C_1-C_6-haloalkyl, C_2-C_6-haloalkenyl, C_1-C_6-alkoxy, C_1-C_4-haloalkoxy, C_1-C_6-alkylthio, C_1-C_4-haloalkylthio, $C(O)R^4$, $COOR^5$, NR^6R^7, $C(O)NR^8R^9$, $S(O)_2NR^8R^9$, $S(O)R^{11}$, $S(O)_2R^{11}$ or C_1-C_4-alkoxy-C_1-C_6-alkyl; or

two adjacent radicals R^a to R^e together with the atoms to which they are attached form a 5-, 6- or 7-membered saturated or unsaturated ring which may contain one or two heteroatoms selected from the group consisting of nitrogen, oxygen, sulfur and a group NR^{10} as ring-forming atom and/or may carry one, two, three or four radicals selected from the group consisting of halogen and C_1-C_4-alkyl;

X, Y independently of one another are oxygen or sulfur;

n is 0 or 1;

A is O, $S(O)_k$ or NR^{12}, where k is 0, 1 or 2;

R^4, R^8, R^9 independently of one another are hydrogen or C_1-C_4-alkyl;

R^5, R^{11} are C_1-C_4-alkyl;

R^6, R^7 independently of one another are hydrogen, C_1-C_6-alkyl, C_3-C_6-alkenyl, C_3-C_6-alkynyl, $C(O)R^4$, $COOR^5$ or $S(O)_2R^{11}$;

R^{10}, R^{12} independently of one another are hydrogen, C_1-C_6-alkyl, C_3-C_6-alkenyl or C_3-C_6-alkynyl; and

R^{13} is phenyl which is unsubstituted or carries 1, 2, 3 or 4 substituents, where the substituents are selected from the group consisting of halogen, nitro, cyano, OH, alkyl, alkoxy, haloalkyl, haloalkoxy, $COOR^5$, NR^6R^7 and $C(O)NR^8R^9$.

Accordingly, the present invention relates to 1-phenyl-pyrrolidin-2-one-3-carboxamides of the formula I and their agriculturally useful salts.

Moreover, the present invention relates to

- the use of compounds I and/or their salts as herbicides;
- crop protection compositions comprising at least one 1-phenylpyrrolidin-2-one-3-carboxamide of the formula I and/or at least one agriculturally useful salt of I as active substances; and
- methods for controlling unwanted vegetation, which comprises allowing a herbicidally effective amount of at least one 1-phenylpyrrolidin-2-one-3-carboxamide of the formula I or an agriculturally useful salt of I to act on plants, their habitat or on seed.

Depending on the substitution pattern, the compounds of the formula I may contain one or more centers of chirality, in which case they are present as mixtures of enantiomers or diastereomers. The invention provides both the pure enantiomers or diastereomers and their mixtures. The invention also provides tautomers of compounds of the formula I.

If R^1 represents hydrogen, the 1-phenylpyrrolidin-2-one-3-carboxamides of the formula I according to the invention can be present in the form of their agriculturally useful salts. In general, agriculturally useful salts are the salts of those bases or cations which have no adverse effect on the herbicidal action of the compounds I. Thus, suitable basic salts are in particular the salts of the alkali metals, preferably of sodium and potassium, of the alkaline earth metals, preferably of calcium, magnesium and barium, and of the transition metals, preferably of manganese, copper, zinc and iron, and also ammonium salts where the ammonium ion may, if desired, carry one to four C_1-C_4-alkyl

substituents, C_1-C_4-hydroxyalkyl substituents, C_1-C_4-alkoxy-C_1-C_4-alkyl substituents and/or one phenyl or benzyl substituent, preferably diisopropylammonium, tetramethylammonium, tetrabutylammonium, trimethylbenzylammonium, trimethyl-2-hydroxyethylammonium, bis(2-hydroxyethyl)methylammonium, tris(2-hydroxyethyl)ammonium, bis(2-hydroxyethyl)-dimethylammonium, tris(2-hydroxyethyl)methylammonium, furthermore phosphonium ions, sulfonium ions, preferably tri(C_1-C_4-alkyl)sulfonium, and sulfoxonium ions, preferably tri(C_1-C_4-alkyl)sulfoxonium.

The organic moieties mentioned in the definition of the substituents R^1 to R^{12} or as radicals on heterocyclic rings are – like the term halo – collective terms for individual listings of the individual group members. All carbon chains, i.e. all alkyl, haloalkyl, cyanoalkyl, aminoalkyl, aminocarbonylalkyl, alkoxy, haloalkoxy, alkylthio, haloalkylthio, alkylsulfinyl, alkylsulfonyl, alkynyl and alkenyl moieties, may be straight-chain or branched. Halogenated substituents preferably carry one to five identical or different halogen atoms. The term halo denotes in each case fluorine, chlorine, bromine or iodine.

Examples of other meanings are:

- C_1–C_4–alkyl: for example methyl, ethyl, propyl, 1–methylethyl, butyl, 1–methylpropyl, 2–methylpropyl or 1,1–dimethylethyl;

- C_1–C_6–alkyl: C_1–C_4–alkyl as mentioned above and also, for example, n-pentyl, 1–methylbutyl, 2–methylbutyl, 3–methylbutyl, 2,2–dimethylpropyl, 1–ethylpropyl, hexyl, 1,1–dimethylpropyl, 1,2–dimethylpropyl, 1–methylpentyl, 2–methylpentyl, 3–methylpentyl, 4–methylpentyl, 1,1–dimethylbutyl, 1,2–dimethylbutyl, 1,3–dimethylbutyl, 2,2–dimethylbutyl, 2,3–dimethylbutyl, 3,3–dimethylbutyl, 1–ethylbutyl, 2–ethylbutyl, 1,1,2–trimethylpropyl, 1–ethyl–1–methylpropyl or 1–ethyl–3–methylpropyl;

- C_1–C_{10}–alkyl: C_1–C_6–alkyl as mentioned above and also, for example, n-heptyl, 2-heptyl, 2-methylhexyl, n-octyl, 1-methylheptyl, 2-ethylhexyl, n-nonyl, 2-nonyl, n-decyl, 2-decyl, 2-propylheptyl and the like;

- C_1–C_4–haloalkyl: a C_1–C_4–alkyl radical as mentioned above which is partially or fully substituted by fluorine, chlorine, bromine and/or iodine, i.e., for example, chloromethyl, dichloromethyl, trichloromethyl, fluoromethyl, difluoromethyl, trifluoromethyl, chlorofluoromethyl,

dichlorofluoromethyl, chlorodifluoromethyl, 2-fluoroethyl, 2-chloroethyl, 2-bromoethyl, 2-iodoethyl, 2,2-difluoroethyl, 2,2,2-trifluoroethyl, 2-chloro-2-fluoroethyl, 2-chloro-2,2-difluoroethyl, 2,2-dichloro-2-fluoroethyl, 2,2,2-trichloroethyl, pentafluoroethyl, 2-fluoropropyl, 3-fluoropropyl, 2,2-difluoropropyl, 2,3-difluoropropyl, 2-chloropropyl, 3-chloropropyl, 2,3-dichloropropyl, 2-bromopropyl, 3-bromopropyl, 3,3,3-trifluoropropyl, 3,3,3-trichloropropyl, 2,2,3,3,3-pentafluoropropyl, heptafluoropropyl, 1-(fluoromethyl)-2-fluoroethyl, 1-(chloromethyl)-2-chloroethyl, 1-(bromomethyl)-2-bromoethyl, 4-fluorobutyl, 4-chlorobutyl, 4-bromobutyl or nonafluorobutyl; in particular difluoromethyl, trifluoromethyl;

- C_1–C_6–haloalkyl: C_1-C_4-haloalkyl as mentioned above and also 5–fluoropentyl, 5–chloropentyl, 5–bromopentyl, 5–iodopentyl, undecafluoropentyl, 6–fluorohexyl, 6–chlorohexyl, 6–bromohexyl, 6–iodohexyl or dodecafluorohexyl;

- C_1–C_2–fluoroalkyl: C_1-C_2-alkyl which carries 1, 2, 3, 4 or 5 fluorine atoms, for example difluoromethyl, trifluoromethyl, 2-fluoroethyl, 2,2-difluoroethyl, 2,2,2-trifluoroethyl, 1,1,2,2-tetrafluoroethyl and pentafluoroethyl;

- C_1–C_2–fluoroalkoxy: C_1-C_2-alkoxy which carries 1, 2, 3, 4 or 5 fluorine atoms, for example difluoromethoxy, trifluoromethoxy, 2-fluoroethoxy, 2,2-difluoroethoxy, 2,2,2-trifluoroethoxy, 1,1,2,2-tetrafluoroethoxy and pentafluoroethoxy;

- C_1–C_4–alkoxy: for example methoxy, ethoxy, n-propoxy, 1–methylethoxy, butoxy, 1–methylpropoxy, 2–methylpropoxy or 1,1–dimethylethoxy;

- C_1–C_6–alkoxy: C_1–C_4–alkoxy as mentioned above and also, for example, pentoxy, 1–methylbutoxy, 2–methylbutoxy, 3–methylbutoxy, 1,1–dimethylpropoxy, 1,2–dimethylpropoxy, 2,2-dimethylpropoxy, 1-ethylpropoxy, hexoxy, 1-methylpentoxy, 2-methylpentoxy, 3-methylpentoxy, 4-methylpentoxy, 1,1-dimethylbutoxy, 1,2-dimethylbutoxy, 1,3-dimethylbutoxy, 2,2-dimethylbutoxy, 2,3-dimethylbutoxy, 3,3-dimethylbutoxy, 1-ethylbutoxy, 2-ethylbutoxy, 1,1,2-trimethylpropoxy, 1,2,2-trimethylpropoxy, 1-ethyl-1-methylpropoxy or 1-ethyl–2-methylpropoxy;

- C_1-C_4-haloalkoxy: a C_1-C_4-alkoxy radical as mentioned above which is partially or fully substituted by fluorine, chlorine, bromine and/or iodine, i.e., for example, OCH_2F, $OCHF_2$, OCF_3, OCH_2Cl, $OCH(Cl)_2$, $OC(Cl)_3$, chlorofluoromethoxy, dichlorofluoromethoxy, chlorodifluoromethoxy, 2-fluoroethoxy, 2-chloroethoxy, 2-bromoethoxy, 2-iodoethoxy, 2,2-difluoroethoxy, 2,2,2-trifluoroethoxy, 2-chloro-2-fluoroethoxy, 2-chloro-2,2-difluoroethoxy, 2,2-dichloro-2-fluoroethoxy, 2,2,2-trichloroethoxy, OC_2F_5, 2-fluoropropoxy, 3-fluoropropoxy, 2,2-difluoropropoxy, 2,3-difluoropropoxy, 2-chloropropoxy, 3-chloropropoxy, 2,3-dichloropropoxy, 2-bromopropoxy, 3-bromopropoxy, 3,3,3-trifluoropropoxy, 3,3,3-trichloropropoxy, OCH_2—C_2F_5, OCF_2-C_2F_5, 1-(CH_2F)-2-fluoroethoxy, 1-(CH_2Cl)-2-chloroethoxy, 1-(CH_2Br)-2-bromoethoxy, 4-fluorobutoxy, 4-chlorobutoxy, 4-bromobutoxy or nonafluorobutoxy, preferably $OCHF_2$ or $OCHF_3$;

- C_1-C_4-alkoxy-C_1-C_6-alkyl: C_1-C_6-alkyl which is substituted by C_1-C_6-alkoxy — as mentioned above -, i.e., for example, CH_2-OCH_3, CH_2-OC_2H_5, n-propoxymethyl, CH_2-$OCH(CH_3)_2$, n-butoxymethyl, (1-methylpropoxy)methyl, (2-methylpropoxy)methyl, CH_2-$OC(CH_3)_3$, 2-(methoxy)ethyl, 2-(ethoxy)ethyl, 2-(n-propoxy)ethyl, 2-(1-methylethoxy)ethyl, 2-(n-butoxy)ethyl, 2-(1-methylpropoxy)ethyl, 2-(2-methylpropoxy)ethyl, 2-(1,1-dimethylethoxy)ethyl, 2-(methoxy)propyl, 2-(ethoxy)propyl, 2-(n-propoxy)propyl, 2-(1-methylethoxy)propyl, 2-(n-butoxy)propyl, 2-(1-methylpropoxy)propyl, 2-(2-methylpropoxy)propyl, 2-(1,1-dimethylethoxy)propyl, 3-(methoxy)propyl, 3-(ethoxy)propyl, 3-(n-propoxy)propyl, 3-(1-methylethoxy)propyl, 3-(n-butoxy)propyl, 3-(1-methylpropoxy)propyl, 3-(2-methylpropoxy)propyl, 3-(1,1-dimethylethoxy)propyl, 2-(methoxy)butyl, 2-(ethoxy)butyl, 2-(n-propoxy)butyl, 2-(1-methylethoxy)butyl, 2-(n-butoxy)butyl, 2-(1-methylpropoxy)butyl, 2-(2-methylpropoxy)butyl, 2-(1,1-dimethylethoxy)butyl, 3-(methoxy)butyl, 3-(ethoxy)butyl, 3-(n-propoxy)butyl, 3-(1-methylethoxy)butyl, 3-(n-butoxy)butyl, 3-(1-methylpropoxy)butyl, 3-(2-methylpropoxy)butyl, 3-(1,1-dimethylethoxy)butyl, 4-(methoxy)butyl, 4-(ethoxy)butyl, 4-(n-propoxy)butyl, 4-(1-methylethoxy)butyl, 4-(n-butoxy)butyl, 4-(1-methylpropoxy)butyl, 4-(2-methylpropoxy)butyl, 4-(1,1-dimethylethoxy)butyl, 2-(1-methylethoxy)pentyl, 2-(n-butoxy)pentyl, 2-(1-methylpropoxy)pentyl, 2-(2-methylpropoxy)pentyl, 2-(1,1-dimethylethoxy)pentyl, 3-(methoxy)pentyl, 3-(ethoxy)pentyl, 3-(n-propoxy)pentyl,

3-(1-methylethoxy)pentyl, 3-(n-butoxy)pentyl,
3-(1-methylpropoxy)pentyl, 3-(2-methylpropoxy)pentyl,
3-(1,1-dimethylethoxy)pentyl, 4-(methoxy)pentyl,
4-(ethoxy)pentyl, 4-(n-propoxy)pentyl,
4-(1-methylethoxy)pentyl, 4-(n-butoxy)pentyl,
4-(1-methylpropoxy)pentyl, 4-(2-methylpropoxy)pentyl,
4-(1,1-dimethylethoxy)pentyl, 4-(methoxy)pentyl,
5-(ethoxy)pentyl, 5-(n-propoxy)pentyl,
5-(1-methylethoxy)pentyl, 5-(n-butoxy)pentyl,
5-(1-methylpropoxy)pentyl, 5-(2-methylpropoxy)pentyl,
5-(1,1-dimethylethoxy)pentyl, 2-(1-methylethoxy)hexyl,
2-(n-butoxy)hexyl, 2-(1-methylpropoxy)hexyl,
2-(2-methylpropoxy)hexyl, 2-(1,1-dimethylethoxy)hexyl,
3-(methoxy)hexyl, 3-(ethoxy)hexyl, 3-(n-propoxy)hexyl,
3-(1-methylethoxy)hexyl, 3-(n-butoxy)hexyl,
3-(1-methylpropoxy)hexyl, 3-(2-methylpropoxy)hexyl,
3-(1,1-dimethylethoxy)hexyl, 4-(methoxy)hexyl,
4-(ethoxy)hexyl, 4-(n-propoxy)hexyl, 4-(1-methylethoxy)hexyl,
4-(n-butoxy)hexyl, 4-(1-methylpropoxy)hexyl,
4-(2-methylpropoxy)hexyl, 4-(1,1-dimethylethoxy)hexyl,
4-(methoxy)hexyl, 5-(ethoxy)hexyl, 5-(n-propoxy)hexyl,
5-(1-methylethoxy)hexyl, 5-(n-butoxy)hexyl,
5-(1-methylpropoxy)hexyl, 5-(2-methylpropoxy)hexyl,
5-(1,1-dimethylethoxy)hexyl, 6-(ethoxy)hexyl,
6-(n-propoxy)hexyl, 6-(1-methylethoxy)hexyl,
6-(n-butoxy)hexyl, 6-(1-methylpropoxy)hexyl,
6-(2-methylpropoxy)hexyl, 6-(1,1-dimethylethoxy)hexyl;

- C_1-C_4-alkylthio: an alkylsulfanyl radical having 1 to 4 carbon atoms, for example SCH_3, SC_2H_5, SCH_2-C_2H_5, $SCH(CH_3)_2$, n-butylthio, $SCH(CH_3)$-C_2H_5, SCH_2-$CH(CH_3)_2$ or $SC(CH_3)_3$;

- C_1-C_6-alkylthio: C_1-C_4-alkylthio as mentioned above and also, for example, pentylthio, 1-methylbutylthio, 2-methylbutylthio, 3-methylbutylthio, 2,2-dimethylpropylthio, 1-ethylpropylthio, hexylthio, 1,1-dimethylpropylthio, 1,2-dimethylpropylthio, 1-methylpentylthio, 2-methylpentylthio, 3-methylpentylthio, 4-methylpentylthio, 1,1-dimethylbutylthio, 1,2-dimethylbutylthio, 1,3-dimethylbutylthio, 2,2-dimethylbutylthio, 2,3-dimethylbutylthio, 3,3-dimethylbutylthio, 1-ethylbutylthio, 2-ethylbutylthio, 1,1,2-trimethylpropylthio, 1,2,2-trimethylpropylthio, 1-ethyl-1-methylpropylthio or 1-ethyl-2-methylpropylthio;

- C_1-C_4-haloalkylthio: a C_1-C_4-alkylthio radical as mentioned above which is partially or fully substituted by fluorine,

chlorine, bromine and/or iodine, i.e., for example, fluoromethylthio, difluoromethylthio, trifluoromethylthio, chlorodifluoromethylthio, bromodifluoromethylthio, 2-fluoroethylthio, 2-chloroethylthio, 2-bromoethylthio, 2-iodoethylthio, 2,2-difluoroethylthio, 2,2,2-trifluoroethylthio, 2,2,2-trichloroethylthio, 2-chloro-2-fluoroethylthio, 2-chloro-2,2-difluoroethylthio, 2,2-dichloro-2-fluoroethylthio, pentafluoroethylthio, 2-fluoropropylthio, 3-fluoropropylthio, 2-chloropropylthio, 3-chloropropylthio, 2-bromopropylthio, 3-bromopropylthio, 2,2-difluoropropylthio, 2,3-difluoropropylthio, 2,3-dichloropropylthio, 3,3,3-trifluoropropylthio, 3,3,3-trichloropropylthio, 2,2,3,3,3-pentafluoropropylthio, heptafluoropropylthio, 1-(fluoromethyl)-2-fluoroethylthio, 1-(chloromethyl)-2-chloroethylthio, 1-(bromomethyl)-2-bromoethylthio, 4-fluorobutylthio, 4-chlorobutylthio, 4-bromobutylthio or nonafluorobutylthio;

- phenyl-C_1-C_4-alkyl: for example benzyl, 1-phenylethyl, 2-phenylethyl, 1-phenylprop-1-yl, 2-phenylprop-1-yl, 3-phenylprop-1-yl, 1-phenylbut-1-yl, 2-phenylbut-1-yl, 3-phenylbut-1-yl, 4-phenylbut-1-yl, 1-phenylbut-2-yl, 2-phenylbut-2-yl, 3-phenylbut-2-yl, 4-phenylbut-2-yl, 1-(benzyl)eth-1-yl, 1-(benzyl)-1-(methyl)eth-1-yl or 1-(benzyl)prop-1-yl;

- C_2-C_6-alkenyl: a monounsaturated aliphatic hydrocarbon radical having 2 to 6 and in particular 2 to 4 carbon atoms, for example ethenyl, prop-1-en-1-yl, prop-2-en-1-yl, 1-methylethenyl, buten-1-yl, buten-2-yl, buten-3-yl, 1-methylprop-1-en-1-yl, 2-methylprop-1-en-1-yl, 1-methylprop-2-en- 1-yl, 2-methylprop-2-en-1-yl, penten-1-yl, penten-2-yl, penten-3-yl, penten-4-yl, 1-methylbut-1-en-1-yl, 2-methylbut-1-en-1-yl, 3-methylbut-1-en-1-yl, 1-methylbut-2-en-1-yl, 2-methylbut-2-en-1-yl, 3-methylbut-2-en-1-yl, 1-methylbut-3-en-1-yl, 2-methylbut-3-en-1-yl, 3-methylbut-3-en-1-yl, 1,1-dimethylprop-2-en-1-yl, 1,2-dimethylprop-1-en-1-yl, 1,2-dimethylprop-2-en-1-yl, 1-ethylprop-1-en-2-yl, 1-ethylprop-2-en-1-yl, hex-1-en-1-yl, hex-2-en-1-yl, hex-3-en-1-yl, hex-4-en-1-yl, hex-5-en-1-yl, 1-methylpent-1-en-1-yl, 2-methylpent-1-en-1-yl, 3-methylpent-1-en-1-yl, 4-methylpent-1-en-1-yl, 1-methylpent-2-en-1-yl, 2-methylpent-2-en-1-yl, 3-methylpent-2-en-1-yl, 4-methylpent-2-en-1-yl, 1-methylpent-3-en-1-yl, 2-methylpent-3-en-1-yl, 3-methylpent-3-en-1-yl, 4-methylpent-3-en-1-yl,

1-methylpent-4-en-1-yl, 2-methylpent-4-en-1-yl,
3-methylpent-4-en-1-yl, 4-methylpent-4-en-1-yl,
1,1-dimethylbut-2-en-1-yl, 1,1-dimethylbut-3-en-1-yl,
1,2-dimethylbut-1-en-1-yl, 1,2-dimethylbut-2-en-1-yl,
1,2-dimethylbut-3-en-1-yl, 1,3-dimethylbut-1-en-1-yl,
1,3-dimethylbut-2-en-1-yl, 1,3-dimethylbut-3-en-1-yl,
2,2-dimethylbut-3-en-1-yl, 2,3-dimethylbut-1-en-1-yl,
2,3-dimethylbut-2-en-1-yl, 2,3-dimethylbut-3-en-1-yl,
3,3-dimethylbut-1-en-1-yl, 3,3-dimethylbut-2-en-1-yl,
1-ethylbut-1-en-1-yl, 1-ethylbut-2-en-1-yl,
1-ethylbut-3-en-1-yl, 2-ethylbut-1-en-1-yl,
2-ethylbut-2-en-1-yl, 2-ethylbut-3-en-1-yl,
1,1,2-trimethylprop-2-en-1-yl,
1-ethyl-1-methylprop-2-en-1-yl,
1-ethyl-2-methylprop-1-en-1-yl and
1-ethyl-2-methylprop-2-en-1-yl;

- C_3–C_8–alkenyl: an aliphatic hydrocarbon radical which contains a C=C double bond and has 3 to 8, preferably 3 to 6 and in particular 3 or 4 carbon atoms as mentioned above, which is preferably not attached via a carbon atom of the double bond, for example one of the radicals mentioned under C_2–C_6–alkenyl and also 1-hepten-3-yl, 1-hepten-4-yl, 1-hepten-5-yl, 1-hepten-6-yl, 1-hepten-7-yl, 3-hepten-1-yl, 2-hepten-4-yl, 3-hepten-5-yl, 3-hepten-6-yl, 3-hepten-7-yl, 1-octen-3-yl, 1-octen-4-yl, 1-octen-5-yl, 1-octen-6-yl, 1-octen-7-yl, 1-octen-8-yl, 3-octen-1-yl, 2-octen-1-yl, 2-octen-4-yl, 3-octen-5-yl, 3-octen-6-yl, 3-octen-7-yl, 3-octen-8-yl and the like;

- C_2-C_6-haloalkenyl: C_2-C_6-alkenyl as mentioned above which is partially or fully substituted by fluorine, chlorine, and/or bromine, i.e., for example, 2-chlorovinyl, 2-chloroallyl, 3-chloroallyl, 2,3-dichloroallyl, 3,3-dichloroallyl, 2,3,3-trichloroallyl, 2,3-dichlorobut-2-enyl, 2-bromoallyl, 3-bromoallyl, 2,3-dibromoallyl, 3,3-dibromoallyl, 2,3,3-tribromoallyl and 2,3-dibromobut-2-enyl;

- C_2–C_6–alkynyl: an aliphatic hydrocarbon radical which contains a C-C triple bond and has 2 to 6 and in particular 2 to 4 carbon atoms: for example ethynyl, propargyl (2-propynyl), 1-propynyl, but–1–yn–3–yl, but–1–yn–4–yl, but–2–yn–1–yl, pent–1–yn–3–yl, pent–1–yn–4–yl, pent–1–yn–5–yl, pent–2–yn–1–yl, pent–2–yn–4–yl, pent–2–yn–5–yl, 3–methylbut–1–yn–3–yl, 3–methylbut–1–yn–4–yl, hex–1–yn–3–yl, hex–1–yn–4–yl, hex–1–yn–5–yl, hex–1–yn–6–yl, hex–2–yn–1–yl, hex–2–yn–4–yl, hex–2–yn–5–yl, hex–2–yn–6–yl, hex–3–yn–1–yl,

hex-3-yn-2-yl, 3-methylpent-1-yn-3-yl, 3-methylpent-1-yn-4-yl, 3-methylpent-1-yn-5-yl, 4-methylpent-2-yn-4-yl or 4-methylpent-2-yn-5-yl;

- C_3-C_{10}-alkynyl: an aliphatic hydrocarbon radical which contains a triple bond and has 3 to 10, preferably 3 to 6 and in particular 3 or 4 carbon atoms as mentioned above, which is preferably not attached via a carbon atom of the triple bond, for example one of the radicals mentioned under C_2-C_6-alkynyl and also 1-heptyn-3-yl, 1-heptyn-4-yl, 1-heptyn-5-yl, 1-heptyn-6-yl, 1-heptyn-7-yl, 3-heptyn-1-yl, 2-heptyn-4-yl, 3-heptyn-5-yl, 3-heptyn-6-yl, 3-heptyn-7-yl, 1-octyn-3-yl, 1-octyn-4-yl, 1-octyn-5-yl, 1-octyn-6-yl, 1-octyn-7-yl, 1-octyn-8-yl, 3-octyn-1-yl, 2-octyn-1-yl, 2-octyn-4-yl, 3-octyn-5-yl, 3-octyn-6-yl, 3-octyn-7-yl, 3-octyn-8-yl and the like;

- C_3-C_{10}-cycloalkyl: a monocyclic hydrocarbon radical having 3 to 10 carbon atoms, in particular 3 to 8 carbon atoms and especially 3 to 6 carbon atoms, for example cyclopropyl, cyclobutyl, cyclopentyl, cyclohexyl, cycloheptyl or cyclooctyl;

- C_7-C_{10}-polycycloalkyl: a bicyclic, tricyclic or tetracyclic hydrocarbon radical having 7 to 10 carbon atoms, for example bicyclo[2.2.1]-hept-1-yl, bicyclo[2.2.1]hept-2-yl, bicyclo[2.2.1]hept-7-yl, bicyclo[2.2.2]oct-1-yl, bicyclo[2.2.2]oct-2-yl or adamantan-1-yl;

- C_3-C_8-cycloalkyl-C_1-C_4-alkyl: C_1-C_4-alkyl which carries a C_3-C_8-cycloalkyl radical as defined above, for example cyclopropylmethyl, 1-cyclopropylethyl, 2-cyclopropylethyl, 1-cyclopropylprop-1-yl, 2-cyclopropylprop-1-yl, 3-cyclopropylprop-1-yl, 1-cyclopropylbut-1-yl, 2-cyclopropylbut-1-yl, 3-cyclopropylbut-1-yl, 4-cyclopropylbut-1-yl, 1-cyclopropylbut-2-yl, 2-cyclopropylbut-2-yl, 3-cyclopropylbut-2-yl, 3-cyclopropylbut-2-yl, 4-cyclopropylbut-2-yl, 1-(cyclopropylmethyl)eth-1-yl, 1-(cyclopropylmethyl)-1-(methyl)eth-1-yl, 1-(cyclopropylmethyl)prop-1-yl, cyclobutylmethyl, 1-cyclobutylethyl, 2-cyclobutylethyl, 1-cyclobutylprop-1-yl, 2-cyclobutylprop-1-yl, 3-cyclobutylprop-1-yl, 1-cyclobutylbut-1-yl, 2-cyclobutylbut-1-yl, 3-cyclobutylbut-1-yl, 4-cyclobutylbut-1-yl, 1-cyclobutylbut-2-yl, 2-cyclobutylbut-2-yl, 3-cyclobutylbut-2-yl, 4-cyclobutylbut-2-yl,

1-(cyclobutylmethyl)eth-1-yl,
1-(cyclobutylmethyl)-1-(methyl)eth-1-yl,
1-(cyclobutylmethyl)prop-1-yl, cyclopentylmethyl,
1-cyclopentylethyl, 2-cyclopentylethyl,
1-cyclopentylprop-1-yl, 2-cyclopentylprop-1-yl,
3-cyclopentylprop-1-yl, 1-cyclopentylbut-1-yl,
2-cyclopentylbut-1-yl, 3-cyclopentylbut-1-yl,
4-cyclopentylbut-1-yl, 1-cyclopentylbut-2-yl,
2-cyclopentylbut-2-yl, 3-cyclopentylbut-2-yl,
3-cyclopentylbut-2-yl, 4-cyclopentylbut-2-yl,
1-(cyclopentylmethyl)eth-1-yl,
1-(cyclopentylmethyl)-1-(methyl)eth-1-yl,
1-(cyclopentylmethyl)prop-1-yl, cyclohexylmethyl,
1-cyclohexylethyl, 2-cyclohexylethyl, 1-cyclohexylprop-1-yl,
2-cyclohexylprop-1-yl, 3-cyclohexylprop-1-yl,
1-cyclohexylbut-1-yl, 2-cyclohexylbut-1-yl,
3-cyclohexylbut-1-yl, 4-cyclohexylbut-1-yl,
1-cyclohexylbut-2-yl, 2-cyclohexylbut-2-yl,
3-cyclohexylbut-2-yl, 4-cyclohexylbut-2-yl,
1-(cyclohexylmethyl)eth-1-yl,
1-(cyclohexylmethyl)-1-(methyl)eth-1-yl,
1-(cyclohexylmethyl)prop-1-yl, cycloheptylmethyl,
1-cycloheptylethyl, 2-cycloheptylethyl,
1-cycloheptylprop-1-yl, 2-cycloheptylprop-1-yl,
3-cycloheptylprop-1-yl, 1-cycloheptylbut-1-yl,
2-cycloheptylbut-1-yl, 3-cycloheptylbut-1-yl,
4-cycloheptylbut-1-yl, 1-cycloheptylbut-2-yl,
2-cycloheptylbut-2-yl, 3-cycloheptylbut-2-yl,
4-cycloheptylbut-2-yl, 1-(cycloheptylmethyl)eth-1-yl,
1-(cycloheptylmethyl)-1-(methyl)eth-1-yl,
1-(cycloheptylmethyl)prop-1-yl, cyclooctylmethyl,
1-cyclooctylethyl, 2-cyclooctylethyl, 1-cyclooctylprop-1-yl,
2-cyclooctylprop-1-yl, 3-cyclooctylprop-1-yl,
1-cyclooctylbut-1-yl, 2-cyclooctylbut-1-yl,
3-cyclooctylbut-1-yl, 4-cyclooctylbut-1-yl,
1-cyclooctylbut-2-yl, 2-cyclooctylbut-2-yl,
3-cyclooctylbut-2-yl, 4-cyclooctylbut-2-yl,
1-(cyclooctylmethyl)eth-1-yl,
1-(cyclooctylmethyl)-1-(methyl)eth-1-yl or
1-(cyclooctylmethyl)prop-1-yl, preferably cyclopropylmethyl, cyclobutylmethyl, cyclopentylmethyl or cyclohexylmethyl.

- C_5–C_{10}–cycloalkenyl: a mono- or bicyclic hydrocarbon radical having 5 to 10 carbon atoms, in particular 5 to 8 carbon atoms and especially 5 to 6 carbon atoms and which contains a C=C double bond, for example cyclopenten-1-yl, cyclopenten-3-yl, cyclohexen-1-yl, cyclohexen-3-yl,

cyclohexen-4-yl, cyclohepten-1-yl, cyclohepten-3-yl, cyclohepten-4-yl, cycloocten-1-yl, cycloocten-3-yl, cycloocten-4-yl, cycloocten-5-yl, bicyclo[2.2.1]hept-2-en-1-yl, bicyclo[2.2.1]hept-2-en-2-yl, bicyclo[2.2.1]hept-2-en-5-yl, bicyclo[2.2.1]hept-2-en-7-yl, bicyclo[2.2.2]oct-2-en-1-yl, bicyclo[2.2.2]oct-2-en-2-yl, bicyclo[2.2.2]oct-2-en-5-yl, bicyclo[2.2.2]oct-2-en-7-yl;

- unsubstituted or substituted phenyl: a phenyl group which is unsubstituted or carries 1, 2, 3 or 4 substituents, where the substituents are selected from the group consisting of halogen, nitro, cyano, OH, alkyl, alkoxy, haloalkyl, haloalkoxy, $COOR^5$, NR^6R^7, $C(O)NR^8R^9$;

- 3- to 7-membered heterocyclyl: a heterocyclic radical which has 3, 4, 5, 6 or 7 ring members, where 1, 2 or 3 of the ring members are heteroatoms selected from the group consisting of oxygen, nitrogen, sulfur, a group SO_2 and a group NR^{10}. Moreover, the heterocycle may optionally contain 1, 2 or 3 carbonyl groups and/or thiocarbonyl groups as ring members. The heterocycle may furthermore contain a ring-fused unsubstituted or substituted phenyl ring. The heterocycle may be aromatic (heteroaryl) or partially or fully saturated.

Examples of saturated heterocycles are:
oxiran-1-yl, aziridin-1-yl, oxetan-2-yl, oxetan-3-yl, thietan-2-yl, thietan-3-yl, azetidin-1-yl, azetidin-2-yl, azetidin-3-yl, tetrahydrofuran-2-yl, tetrahydrofuran-3-yl, tetrahydrothiophen-2-yl, tetrahydrothiophen-3-yl, pyrrolidin-1-yl, pyrrolidin-2-yl, pyrrolidin-3-yl, 1,3-dioxolan-2-yl, 1,3-dioxolan-4-yl, 1,3-oxathiolan-2-yl, 1,3-oxathiolan-4-yl, 1,3-oxathiolan-5-yl, 1,3-oxazolidin-2-yl, 1,3-oxazolidin-3-yl, 1,3-oxazolidin-4-yl, 1,3-oxazolidin-5-yl, 1,2-oxazolidin-2-yl, 1,2-oxazolidin-3-yl, 1,2-oxazolidin-4-yl, 1,2-oxazolidin-5-yl, 1,3-dithiolan-2-yl, 1,3-dithiolan-4-yl, pyrrolidin-1-yl, pyrrolidin-2-yl, pyrrolidin-5-yl, tetrahydropyrazol-1-yl, tetrahydropyrazol-3-yl, tetrahydropyrazol-4-yl, tetrahydropyran-2-yl, tetrahydropyran-3-yl, tetrahydropyran-4-yl, tetrahydrothiopyran-2-yl, tetrahydrothiopyran-3-yl, tetrahydropyran-4-yl, piperidin-1-yl, piperidin-2-yl, piperidin-3-yl, piperidin-4-yl, 1,3-dioxan-2-yl, 1,3-dioxan-4-yl, 1,3-dioxan-5-yl, 1,4-dioxan-2-yl, 1,3-oxathian-2-yl, 1,3-oxathian-4-yl, 1,3-oxathian-5-yl, 1,3-oxathian-6-yl, 1,4-oxathian-2-yl, 1,4-oxathian-3-yl, morpholin-2-yl,

morpholin-3-yl, morpholin-4-yl, hexahydropyridazin-1-yl, hexahydropyridazin-3-yl, hexahydropyridazin-4-yl, hexahydropyrimidin-1-yl, hexahydropyrimidin-2-yl, hexahydropyrimidin-4-yl, hexahydropyrimidin-5-yl, piperazin-1-yl, piperazin-2-yl, piperazin-3-yl, hexahydro-1,3,5-triazin-1-yl, hexahydro-1,3,5-triazin-2-yl, oxepan-2-yl, oxepan-3-yl, oxepan-4-yl, thiepan-2-yl, thiepan-3-yl, thiepan-4-yl, 1,3-dioxepan-2-yl, 1,3-dioxepan-4-yl, 1,3-dioxepan-5-yl, 1,3-dioxepan-6-yl, 1,3-dithiepan-2-yl, 1,3-dithiepan-4-yl, 1,3-dithiepan-5-yl, 1,3-dithiepan-6-yl, 1,4-dioxepan-2-yl, 1,4-dioxepan-7-yl, hexahydroazepin-1-yl, hexahydroazepin-2-yl, hexahydroazepin-3-yl, hexahydroazepin-4-yl, hexahydro-1,3-diazepin-1-yl, hexahydro-1,3-diazepin-2-yl, hexahydro-1,3-diazepin-4-yl, hexahydro-1,4-diazepin-1-yl and hexahydro-1,4-diazepin-2-yl;

Examples of unsaturated heterocycles are: dihydrofuran-2-yl, 1,2-oxazolin-3-yl, 1,2-oxazolin-5-yl, 1,3-oxazolin-2-yl;

Examples of aromatic heterocyclyl are the 5- and 6-membered aromatic, heterocyclic radicals, for example furyl, such as 2-furyl and 3-furyl, thienyl, such as 2-thienyl and 3-thienyl, pyrrolyl, such as 2-pyrrolyl and 3-pyrrolyl, isoxazolyl, such as 3-isoxazolyl, 4-isoxazolyl and 5-isoxazolyl, isothiazolyl, such as 3-isothiazolyl, 4-isothiazolyl and 5-isothiazolyl, pyrazolyl, such as 3-pyrazolyl, 4-pyrazolyl and 5-pyrazolyl, oxazolyl, such as 2-oxazolyl, 4-oxazolyl and 5-oxazolyl, thiazolyl, such as 2-thiazolyl, 4-thiazolyl and 5-thiazolyl, imidazolyl, such as 2-imidazolyl and 4-imidazolyl, oxadiazolyl, such as 1,2,4-oxadiazol-3-yl, 1,2,4-oxadiazol-5-yl and 1,3,4-oxadiazol-2-yl, thiadiazolyl, such as 1,2,4-thiadiazol-3-yl, 1,2,4-thiadiazol-5-yl and 1,3,4-thiadiazol-2-yl, triazolyl, such as 1,2,4-triazol-1-yl, 1,2,4-triazol-3-yl and 1,2,4-triazol-4-yl, pyridinyl, such as 2-pyridinyl, 3-pyridinyl and 4-pyridinyl, pyridazinyl, such as 3-pyridazinyl and 4-pyridazinyl, pyrimidinyl, such as 2-pyrimidinyl, 4-pyrimidinyl and 5-pyrimidinyl, furthermore 2-pyrazinyl, 1,3,5-triazin-2-yl and 1,2,4-triazin-3-yl, in particular pyridyl, pyrimidyl, furanyl and thienyl.

If the radicals R^2 and R^3 together with the nitrogen atom to which they are attached form a saturated heterocycle, n is preferably 0. In this case, the saturated heterocycle is selected, for example, from the group consisting of 1,3-oxazolidin-3-yl,

1,2-oxazolidin-2-yl, pyrrolidin-1-yl, pyrrolidin-2-on-1-yl, tetrahydropyrazol-1-yl, 2-methyltetrahydropyrazol-1-yl, piperidin-1-yl, piperidin-2-on-1-yl, morpholin-4-yl, hexahydropyrimidin-1-yl, piperazin-1-yl, 4-methylpiperazin-1-yl, hexahydro-1,3,5-triazin-1-yl, 3,5-dimethyltriazin-1-yl, hexahydroazepin-1-yl, hexahydroazepin-2-on-1-yl, hexahydro-1,3-diazepin-1-yl, hexahydro-1,4-diazepin-1-yl, in particular from the group consisting of pyrrolidin-1-yl, piperidin-1-yl and morpholin-4-yl.

If two adjacent radicals R^a to R^e together with the atoms to which they are attached form a 5-, 6- or 7-membered saturated or unsaturated ring which may contain one or two heteroatoms selected from the group consisting of nitrogen, oxygen, sulfur and a group NR^{10} as ring-forming atom(s) and/or may carry one, two, three or four radicals selected from the group consisting of halogen and C_1-C_4-alkyl, two adjacent radicals R^a to R^e, for example R^b and R^c or R^c and R^d, together are a 3-, 4- or 5-membered saturated or unsaturated carbon chain in which one or two non-adjacent carbon atoms of the chain may be replaced by heteroatoms selected from the group consisting of O, N, a group NR^{10} and S and in which the carbon atoms of the chain may carry one, two, three or four substituents selected from the group consisting of halogen and C_1-C_4-alkyl. For example, two adjacent radicals R^a to R^e may be a chain of the formula $-O-CH_2-O-$, $-O-(CH_2)_2-O-$, $-O-(CH_2)_2-$, $-O-(CH_2)_3-$, $-(CH_2)_3-$, $-(CH_2)_4-$ or $-(CH_2)_5-$.

With a view to the use of the compounds of the formula I according to the invention as herbicides, the variables R^1, R^2, R^3, X, Y, A, n, R^a, R^b, R^c, R^d and R^e are preferably as defined below, independently of one another and in particular in combination:

R^1 is hydrogen, OH, Cl, Br, C_1-C_6-alkyl or $OC(O)R^4$, particularly preferably hydrogen;

R^2 is C_1-C_{10}-alkyl, C_3-C_8-cycloalkyl, C_3-C_8-alkenyl, C_3-C_8-alkynyl, C_3-C_8-cycloalkyl, C_5-C_8-cycloalkenyl or C_3-C_8-cycloalkyl-C_1-C_4-alkyl, where C_1-C_{10}-alkyl and C_3-C_8-cycloalkyl may be partially or fully halogenated and/or may carry one or two radicals selected from the group consisting of C_1-C_6-alkoxy, C_1-C_4-haloalkoxy, C_1-C_6-alkylthio, C_1-C_4-haloalkylthio, unsubstituted or substituted phenyl, $COOR^5$, NR^6R^7, $C(O)NR^8R^9$, phenyl which may be unsubstituted or substituted by 1, 2 or 3 substituents selected from the group consisting of halogen, nitro, OH, CN, C_1-C_6-alkyl, C_1-C_6-alkoxy, C_1-C_4-haloalkoxy, C_1-C_6-alkylthio,

C_1-C_4-haloalkylthio, unsubstituted or substituted phenyl, $COOR^5$, NR^6R^7, $C(O)NR^8R^9$. In particular, R^2 is C_1-C_6-alkyl, C_3-C_6-cycloalkyl, C_3-C_6-alkenyl, C_3-C_6-alkynyl, C_5-C_6-cycloalkenyl, C_3-C_6-cycloalkyl-C_1-C_4-alkyl or unsubstituted or substituted phenyl, where C_1-C_6-alkyl and C_3-C_6-cycloalkyl may be partially or fully halogenated and/or may carry one or two, in particular one, radical selected from the group consisting of C_1-C_6-alkoxy, C_1-C_4-haloalkoxy, C_1-C_6-alkylthio, C_1-C_4-haloalkylthio, unsubstituted or substituted phenyl, $COOR^5$, NR^6R^7, $C(O)NR^8R^9$. Particularly preferably, R^2 is C_1-C_6-alkyl, C_3-C_8-cycloalkyl, unsubstituted or substituted phenyl, phenylalkyl or C_3-C_8-cycloalkyl-C_1-C_4-alkyl;

R^3 is hydrogen or C_1-C_6-alkyl;

X is oxygen;

Y is oxygen; and

A if present, is oxygen, a group N-R^{12}, where R^{12} = hydrogen or alkyl, or a group SO_2;

n is 0;

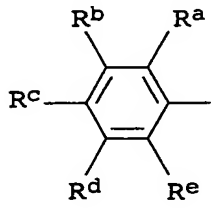
R^a, R^b, R^c, R^d, R^e are hydrogen, halogen, CN, C_1-C_4-alkyl, C_1-C_4-haloalkyl, C_1-C_4-alkoxy, C_1-C_4-haloalkoxy, in particular halogen, CN, C_1-C_4-alkyl, C_1-C_2-fluoroalkyl and C_1-C_2-fluoroalkoxy and especially fluorine, chlorine, bromine, CN, C_1-C_4-alkyl, methoxy, CF_3, CHF_2, OCF_3 and $OCHF_2$.

With a view to the use as herbicides, preference is given to 1-phenylpyrrolidin-2-one-3-carboxamides of the formula I according to the invention where not more than 3 of the radicals R^a, R^b, R^c, R^d and R^e and in particular 3 or 4 of the abovementioned radicals are different from hydrogen. Particular preference is given to 1-phenylpyrrolidin-2-one-3-carboxamides of the formula I where at least R^b and/or R^d are different from hydrogen. In this case, the other radicals R^a-R^e, at least one of the radicals R^a and R^e and especially both radicals R^a and R^e are particularly preferably hydrogen. Particular preference is also given to compounds of the formula I in which R^b and R^c or R^d and R^c are different from hydrogen and the other radicals of the radicals R^a-R^e are hydrogen. Another preferred embodiment of the invention relates to compounds in which the radicals R^a and R^e or

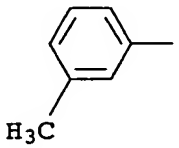
R^a and R^b or R^a and R^c are different from hydrogen and the other radicals of the radicals R^a-R^e are hydrogen.

Preferred radicals R^a, R^b, R^c, R^d, R^e are, in addition to hydrogen, the substituents halogen, CN, C_1-C_4-alkyl, C_1-C_4-haloalkyl, C_1-C_4-alkoxy, C_1-C_4-haloalkoxy, in particular halogen, CN, C_1-C_4-alkyl, C_1-C_2-fluoroalkyl and C_1-C_2-fluoroalkoxy and especially fluorine, chlorine, bromine, CN, C_1-C_4-alkyl, methoxy, CF_3, CHF_2, OCF_3 and $OCHF_2$.

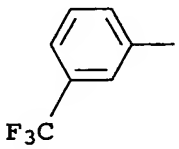
A particularly preferred group of compounds of the formula I are those compounds in which R^a and R^e are hydrogen. Here, the radical



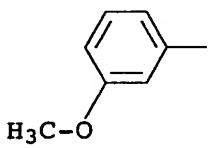
denotes, for example, a group of the formulae Q1 to Q31:



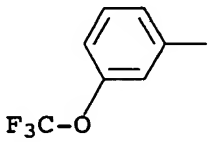
Q1



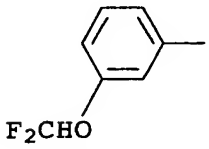
Q2



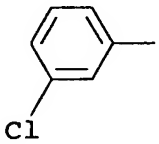
Q3



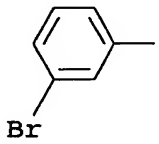
Q4



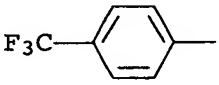
Q5



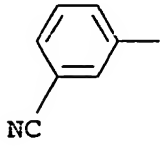
Q6



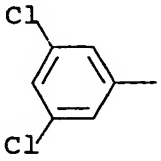
Q7



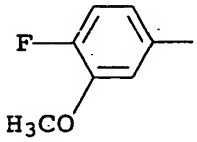
Q8



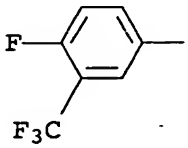
Q9



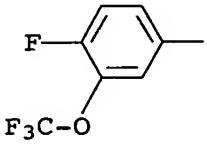
Q10



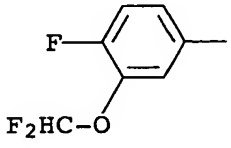
Q11



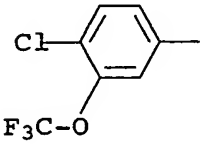
Q12



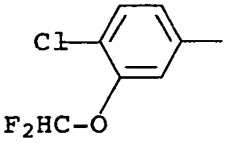
Q13



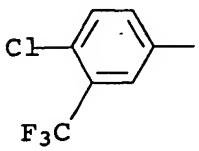
Q14

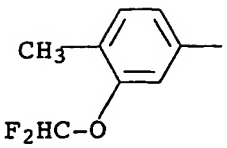


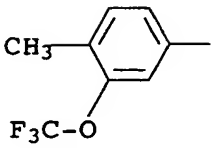
Q15

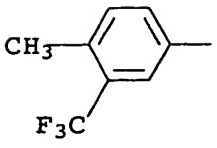


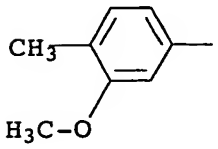
Q16

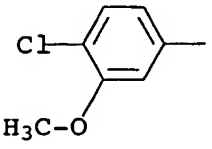

Q17

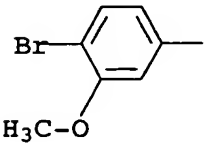

Q18

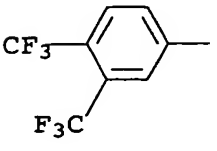

Q19

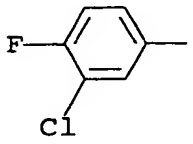

Q20

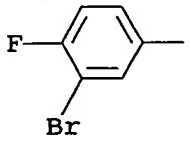

Q21

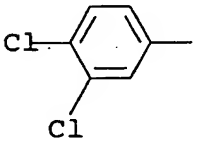

Q22

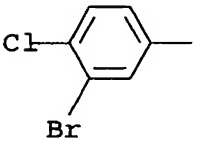

Q23

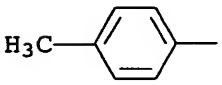

Q24

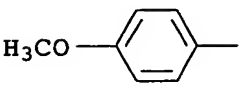

Q25

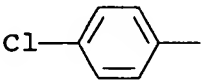

Q26


Q27

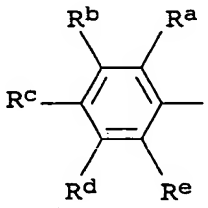

Q28


Q29

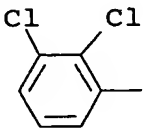

Q30

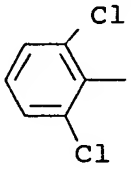

Q31

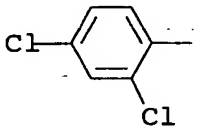
Another preferred group of compounds of the formula I are those compounds in which R^a and, if appropriate, one of the radicals R^b, R^c or R^e are different from hydrogen and the other radicals R^a-R^e are hydrogen. Here, the radical

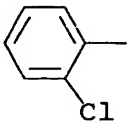


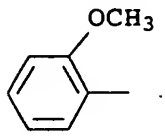
denotes, for example, a group of the formulae Q32 to Q39:


Q32

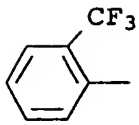

Q33


Q34

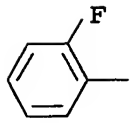

Q35



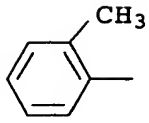
Q36



Q37

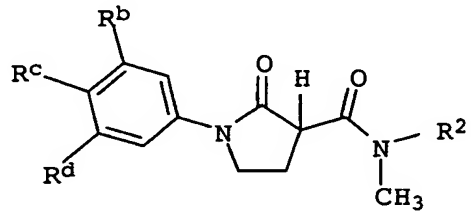


Q38



Q39

Particular preference is given to the 1-phenylpyrrolidin-2-one-3-carboxamides of the formula Ia (≡ I where R^a = R^b = H, X = O, Y = O, R^1 = H, R^3 = CH_3 and n = 0) where R^b, R^c, R^d and R^2 have the meanings mentioned above, in particular the meanings mentioned as being preferred. Examples of such compounds are the compounds Ia.1 to Ia.1717 in which the variables R^b, R^c, R^d and R^2 together have the meanings given in one row of Table 1.



(Ia)

Table 1:

No.	R^b	R^c	R^d	R^2
1.	Cl	H	H	H
2.	Br	H	H	H
3.	F	H	H	H
4.	CH_3	H	H	H
5.	C_2H_5	H	H	H
6.	$CH(CH_3)_2$	H	H	H
7.	OCH_3	H	H	H
8.	CN	H	H	H
9.	CF_3	H	H	H
10.	OCF_3	H	H	H
11.	$OCHF_2$	H	H	H
12.	Cl	H	H	CH_3
13.	Br	H	H	CH_3
14.	F	H	H	CH_3
15.	CH_3	H	H	CH_3
16.	C_2H_5	H	H	CH_3
17.	$CH(CH_3)_2$	H	H	CH_3
18.	OCH_3	H	H	CH_3
19.	CN	H	H	CH_3
20.	CF_3	H	H	CH_3
21.	OCF_3	H	H	CH_3
22.	$OCHF_2$	H	H	CH_3

No.	R^b	R^c	R^d	R^2
23.	Cl	H	H	C_2H_5
24.	Br	H	H	C_2H_5
25.	F	H	H	C_2H_5
26.	CH_3	H	H	C_2H_5
27.	C_2H_5	H	H	C_2H_5
28.	$CH(CH_3)_2$	H	H	C_2H_5
29.	OCH_3	H	H	C_2H_5
30.	CN	H	H	C_2H_5
31.	CF_3	H	H	C_2H_5
32.	OCF_3	H	H	C_2H_5
33.	$OCHF_2$	H	H	C_2H_5
34.	Cl	H	H	$n-C_3H_7$
35.	Br	H	H	$n-C_3H_7$
36.	F	H	H	$n-C_3H_7$
37.	CH_3	H	H	$n-C_3H_7$
38.	C_2H_5	H	H	$n-C_3H_7$
39.	$CH(CH_3)_2$	H	H	$n-C_3H_7$
40.	OCH_3	H	H	$n-C_3H_7$
41.	CN	H	H	$n-C_3H_7$
42.	CF_3	H	H	$n-C_3H_7$
43.	OCF_3	H	H	$n-C_3H_7$
44.	$OCHF_2$	H	H	$n-C_3H_7$
45.	Cl	H	H	$CH(CH_3)_2$
46.	Br	H	H	$CH(CH_3)_2$
47.	F	H	H	$CH(CH_3)_2$
48.	CH_3	H	H	$CH(CH_3)_2$
49.	C_2H_5	H	H	$CH(CH_3)_2$
50.	$CH(CH_3)_2$	H	H	$CH(CH_3)_2$
51.	OCH_3	H	H	$CH(CH_3)_2$
52.	CN	H	H	$CH(CH_3)_2$
53.	CF_3	H	H	$CH(CH_3)_2$
54.	OCF_3	H	H	$CH(CH_3)_2$
55.	$OCHF_2$	H	H	$CH(CH_3)_2$
56.	Cl	H	H	$n-C_4H_9$
57.	Br	H	H	$n-C_4H_9$
58.	F	H	H	$n-C_4H_9$
59.	CH_3	H	H	$n-C_4H_9$
60.	C_2H_5	H	H	$n-C_4H_9$
61.	$CH(CH_3)_2$	H	H	$n-C_4H_9$
62.	OCH_3	H	H	$n-C_4H_9$
63.	CN	H	H	$n-C_4H_9$
64.	CF_3	H	H	$n-C_4H_9$
65.	OCF_3	H	H	$n-C_4H_9$
66.	$OCHF_2$	H	H	$n-C_4H_9$
67.	Cl	H	H	$C(CH_3)_3$
68.	Br	H	H	$C(CH_3)_3$
69.	F	H	H	$C(CH_3)_3$
70.	CH_3	H	H	$C(CH_3)_3$
71.	C_2H_5	H	H	$C(CH_3)_3$
72.	$CH(CH_3)_2$	H	H	$C(CH_3)_3$
73.	OCH_3	H	H	$C(CH_3)_3$

No.	R^b	R^c	R^d	R^2
74.	CN	H	H	$C(CH_3)_3$
75.	CF_3	H	H	$C(CH_3)_3$
76.	OCF_3	H	H	$C(CH_3)_3$
77.	$OCHF_2$	H	H	$C(CH_3)_3$
78.	Cl	H	H	C_6H_5
79.	Br	H	H	C_6H_5
80.	F	H	H	C_6H_5
81.	CH_3	H	H	C_6H_5
82.	C_2H_5	H	H	C_6H_5
83.	$CH(CH_3)_2$	H	H	C_6H_5
84.	OCH_3	H	H	C_6H_5
85.	CN	H	H	C_6H_5
86.	CF_3	H	H	C_6H_5
87.	OCF_3	H	H	C_6H_5
88.	$OCHF_2$	H	H	C_6H_5
89.	Cl	H	H	cyclopropyl
90.	Br	H	H	cyclopropyl
91.	F	H	H	cyclopropyl
92.	CH_3	H	H	cyclopropyl
93.	C_2H_5	H	H	cyclopropyl
94.	$CH(CH_3)_2$	H	H	cyclopropyl
95.	OCH_3	H	H	cyclopropyl
96.	CN	H	H	cyclopropyl
97.	CF_3	H	H	cyclopropyl
98.	OCF_3	H	H	cyclopropyl
99.	$OCHF_2$	H	H	cyclopropyl
100.	Cl	H	H	CH_2-cyclopropyl
101.	Br	H	H	CH_2-cyclopropyl
102.	F	H	H	CH_2-cyclopropyl
103.	CH_3	H	H	CH_2-cyclopropyl
104.	C_2H_5	H	H	CH_2-cyclopropyl
105.	$CH(CH_3)_2$	H	H	CH_2-cyclopropyl
106.	OCH_3	H	H	CH_2-cyclopropyl
107.	CN	H	H	CH_2-cyclopropyl
108.	CF_3	H	H	CH_2-cyclopropyl
109.	OCF_3	H	H	CH_2-cyclopropyl
110.	$OCHF_2$	H	H	CH_2-cyclopropyl
111.	Cl	H	H	cyclobutyl
112.	Br	H	H	cyclobutyl
113.	F	H	H	cyclobutyl
114.	CH_3	H	H	cyclobutyl
115.	C_2H_5	H	H	cyclobutyl
116.	$CH(CH_3)_2$	H	H	cyclobutyl
117.	OCH_3	H	H	cyclobutyl
118.	CN	H	H	cyclobutyl
119.	CF_3	H	H	cyclobutyl
120.	OCF_3	H	H	cyclobutyl
121.	$OCHF_2$	H	H	cyclobutyl
122.	Cl	H	H	cyclopentyl
123.	Br	H	H	cyclopentyl
124.	F	H	H	cyclopentyl

No.	R^b	R^c	R^d	R^2
125.	CH_3	H	H	cyclopentyl
126.	C_2H_5	H	H	cyclopentyl
127.	$CH(CH_3)_2$	H	H	cyclopentyl
128.	OCH_3	H	H	cyclopentyl
129.	CN	H	H	cyclopentyl
130.	CF_3	H	H	cyclopentyl
131.	OCF_3	H	H	cyclopentyl
132.	$OCHF_2$	H	H	cyclopentyl
133.	Cl	H	H	cyclohexyl
134.	Br	H	H	cyclohexyl
135.	F	H	H	cyclohexyl
136.	CH_3	H	H	cyclohexyl
137.	C_2H_5	H	H	cyclohexyl
138.	$CH(CH_3)_2$	H	H	cyclohexyl
139.	OCH_3	H	H	cyclohexyl
140.	CN	H	H	cyclohexyl
141.	CF_3	H	H	cyclohexyl
142.	OCF_3	H	H	cyclohexyl
143.	$OCHF_2$	H	H	cyclohexyl
144.	H	Cl	H	H
145.	H	Br	H	H
146.	H	F	H	H
147.	H	CH_3	H	H
148.	H	C_2H_5	H	H
149.	H	$CH(CH_3)_2$	H	H
150.	H	OCH_3	H	H
151.	H	CN	H	H
152.	H	CF_3	H	H
153.	H	OCF_3	H	H
154.	H	$OCHF_2$	H	H
155.	H	Cl	H	CH_3
156.	H	Br	H	CH_3
157.	H	F	H	CH_3
158.	H	CH_3	H	CH_3
159.	H	C_2H_5	H	CH_3
160.	H	$CH(CH_3)_2$	H	CH_3
161.	H	OCH_3	H	CH_3
162.	H	CN	H	CH_3
163.	H	CF_3	H	CH_3
164.	H	OCF_3	H	CH_3
165.	H	$OCHF_2$	H	CH_3
166.	H	Cl	H	C_2H_5
167.	H	Br	H	C_2H_5
168.	H	F	H	C_2H_5
169.	H	CH_3	H	C_2H_5
170.	H	C_2H_5	H	C_2H_5
171.	H	$CH(CH_3)_2$	H	C_2H_5
172.	H	OCH_3	H	C_2H_5
173.	H	CN	H	C_2H_5
174.	H	CF_3	H	C_2H_5
175.	H	OCF_3	H	C_2H_5

No.	R^b	R^c	R^d	R^2
176.	H	$OCHF_2$	H	C_2H_5
177.	H	Cl	H	n-C_3H_7
178.	H	Br	H	n-C_3H_7
179.	H	F	H	n-C_3H_7
180.	H	CH_3	H	n-C_3H_7
181.	H	C_2H_5	H	n-C_3H_7
182.	H	$CH(CH_3)_2$	H	n-C_3H_7
183.	H	OCH_3	H	n-C_3H_7
184.	H	CN	H	n-C_3H_7
185.	H	CF_3	H	n-C_3H_7
186.	H	OCF_3	H	n-C_3H_7
187.	H	$OCHF_2$	H	n-C_3H_7
188.	H	Cl	H	$CH(CH_3)_2$
189.	H	Br	H	$CH(CH_3)_2$
190.	H	F	H	$CH(CH_3)_2$
191.	H	CH_3	H	$CH(CH_3)_2$
192.	H	C_2H_5	H	$CH(CH_3)_2$
193.	H	$CH(CH_3)_2$	H	$CH(CH_3)_2$
194.	H	OCH_3	H	$CH(CH_3)_2$
195.	H	CN	H	$CH(CH_3)_2$
196.	H	CF_3	H	$CH(CH_3)_2$
197.	H	OCF_3	H	$CH(CH_3)_2$
198.	H	$OCHF_2$	H	$CH(CH_3)_2$
199.	H	Cl	H	n-C_4H_9
200.	H	Br	H	n-C_4H_9
201.	H	F	H	n-C_4H_9
202.	H	CH_3	H	n-C_4H_9
203.	H	C_2H_5	H	n-C_4H_9
204.	H	$CH(CH_3)_2$	H	n-C_4H_9
205.	H	OCH_3	H	n-C_4H_9
206.	H	CN	H	n-C_4H_9
207.	H	CF_3	H	n-C_4H_9
208.	H	OCF_3	H	n-C_4H_9
209.	H	$OCHF_2$	H	n-C_4H_9
210.	H	Cl	H	$C(CH_3)_3$
211.	H	Br	H	$C(CH_3)_3$
212.	H	F	H	$C(CH_3)_3$
213.	H	CH_3	H	$C(CH_3)_3$
214.	H	C_2H_5	H	$C(CH_3)_3$
215.	H	$CH(CH_3)_2$	H	$C(CH_3)_3$
216.	H	OCH_3	H	$C(CH_3)_3$
217.	H	CN	H	$C(CH_3)_3$
218.	H	CF_3	H	$C(CH_3)_3$
219.	H	OCF_3	H	$C(CH_3)_3$
220.	H	$OCHF_2$	H	$C(CH_3)_3$
221.	H	Cl	H	C_6H_5
222.	H	Br	H	C_6H_5
223.	H	F	H	C_6H_5
224.	H	CH_3	H	C_6H_5
225.	H	C_2H_5	H	C_6H_5
226.	H	$CH(CH_3)_2$	H	C_6H_5

No.	R^b	R^c	R^d	R^2
227.	H	OCH_3	H	C_6H_5
228.	H	CN	H	C_6H_5
229.	H	CF_3	H	C_6H_5
230.	H	OCF_3	H	C_6H_5
231.	H	$OCHF_2$	H	C_6H_5
232.	H	Cl	H	cyclopropyl
233.	H	Br	H	cyclopropyl
234.	H	F	H	cyclopropyl
235.	H	CH_3	H	cyclopropyl
236.	H	C_2H_5	H	cyclopropyl
237.	H	$CH(CH_3)_2$	H	cyclopropyl
238.	H	OCH_3	H	cyclopropyl
239.	H	CN	H	cyclopropyl
240.	H	CF_3	H	cyclopropyl
241.	H	OCF_3	H	cyclopropyl
242.	H	$OCHF_2$	H	cyclopropyl
243.	H	Cl	H	CH_2-cyclopropyl
244.	H	Br	H	CH_2-cyclopropyl
245.	H	F	H	CH_2-cyclopropyl
246.	H	CH_3	H	CH_2-cyclopropyl
247.	H	C_2H_5	H	CH_2-cyclopropyl
248.	H	$CH(CH_3)_2$	H	CH_2-cyclopropyl
249.	H	OCH_3	H	CH_2-cyclopropyl
250.	H	CN	H	CH_2-cyclopropyl
251.	H	CF_3	H	CH_2-cyclopropyl
252.	H	OCF_3	H	CH_2-cyclopropyl
253.	H	$OCHF_2$	H	CH_2-cyclopropyl
254.	H	Cl	H	cyclobutyl
255.	H	Br	H	cyclobutyl
256.	H	F	H	cyclobutyl
257.	H	CH_3	H	cyclobutyl
258.	H	C_2H_5	H	cyclobutyl
259.	H	$CH(CH_3)_2$	H	cyclobutyl
260.	H	OCH_3	H	cyclobutyl
261.	H	CN	H	cyclobutyl
262.	H	CF_3	H	cyclobutyl
263.	H	OCF_3	H	cyclobutyl
264.	H	$OCHF_2$	H	cyclobutyl
265.	H	Cl	H	cyclopentyl
266.	H	Br	H	cyclopentyl
267.	H	F	H	cyclopentyl
268.	H	CH_3	H	cyclopentyl
269.	H	C_2H_5	H	cyclopentyl
270.	H	$CH(CH_3)_2$	H	cyclopentyl
271.	H	OCH_3	H	cyclopentyl
272.	H	CN	H	cyclopentyl
273.	H	CF_3	H	cyclopentyl
274.	H	OCF_3	H	cyclopentyl
275.	H	$OCHF_2$	H	cyclopentyl
276.	H	Cl	H	cyclohexyl
277.	H	Br	H	cyclohexyl

No.	R^b	R^c	R^d	R^2
278.	H	F	H	cyclohexyl
279.	H	CH_3	H	cyclohexyl
280.	H	C_2H_5	H	cyclohexyl
281.	H	$CH(CH_3)_2$	H	cyclohexyl
282.	H	OCH_3	H	cyclohexyl
283.	H	CN	H	cyclohexyl
284.	H	CF_3	H	cyclohexyl
285.	H	OCF_3	H	cyclohexyl
286.	H	$OCHF_2$	H	cyclohexyl
287.	CF_3	Br	H	H
288.	CF_3	OCH_3	H	H
289.	CF_3	Cl	H	H
290.	CF_3	F	H	H
291.	CF_3	CH_3	H	H
292.	CF_3	C_2H_5	H	H
293.	CF_3	CF_3	H	H
294.	CF_3	OCF_3	H	H
295.	CF_3	$OCHF_2$	H	H
296.	CF_3	Br	H	CH_3
297.	CF_3	OCH_3	H	CH_3
298.	CF_3	Cl	H	CH_3
299.	CF_3	F	H	CH_3
300.	CF_3	CH_3	H	CH_3
301.	CF_3	C_2H_5	H	CH_3
302.	CF_3	CF_3	H	CH_3
303.	CF_3	OCF_3	H	CH_3
304.	CF_3	$OCHF_2$	H	CH_3
305.	CF_3	Br	H	C_2H_5
306.	CF_3	OCH_3	H	C_2H_5
307.	CF_3	Cl	H	C_2H_5
308.	CF_3	F	H	C_2H_5
309.	CF_3	CH_3	H	C_2H_5
310.	CF_3	C_2H_5	H	C_2H_5
311.	CF_3	CF_3	H	C_2H_5
312.	CF_3	OCF_3	H	C_2H_5
313.	CF_3	$OCHF_2$	H	C_2H_5
314.	CF_3	Br	H	$n\text{-}C_3H_7$
315.	CF_3	OCH_3	H	$n\text{-}C_3H_7$
316.	CF_3	Cl	H	$n\text{-}C_3H_7$
317.	CF_3	F	H	$n\text{-}C_3H_7$
318.	CF_3	CH_3	H	$n\text{-}C_3H_7$
319.	CF_3	C_2H_5	H	$n\text{-}C_3H_7$
320.	CF_3	CF_3	H	$n\text{-}C_3H_7$
321.	CF_3	OCF_3	H	$n\text{-}C_3H_7$
322.	CF_3	$OCHF_2$	H	$n\text{-}C_3H_7$
323.	CF_3	Br	H	$CH(CH_3)_2$
324.	CF_3	OCH_3	H	$CH(CH_3)_2$
325.	CF_3	Cl	H	$CH(CH_3)_2$
326.	CF_3	F	H	$CH(CH_3)_2$
327.	CF_3	CH_3	H	$CH(CH_3)_2$
328.	CF_3	C_2H_5	H	$CH(CH_3)_2$

No.	R^b	R^c	R^d	R^2
329.	CF_3	CF_3	H	$CH(CH_3)_2$
330.	CF_3	OCF_3	H	$CH(CH_3)_2$
331.	CF_3	$OCHF_2$	H	$CH(CH_3)_2$
332.	CF_3	Br	H	$n-C_4H_9$
333.	CF_3	OCH_3	H	$n-C_4H_9$
334.	CF_3	Cl	H	$n-C_4H_9$
335.	CF_3	F	H	$n-C_4H_9$
336.	CF_3	CH_3	H	$n-C_4H_9$
337.	CF_3	C_2H_5	H	$n-C_4H_9$
338.	CF_3	CF_3	H	$n-C_4H_9$
339.	CF_3	OCF_3	H	$n-C_4H_9$
340.	CF_3	$OCHF_2$	H	$n-C_4H_9$
341.	CF_3	Br	H	$C(CH_3)_3$
342.	CF_3	OCH_3	H	$C(CH_3)_3$
343.	CF_3	Cl	H	$C(CH_3)_3$
344.	CF_3	F	H	$C(CH_3)_3$
345.	CF_3	CH_3	H	$C(CH_3)_3$
346.	CF_3	C_2H_5	H	$C(CH_3)_3$
347.	CF_3	CF_3	H	$C(CH_3)_3$
348.	CF_3	OCF_3	H	$C(CH_3)_3$
349.	CF_3	$OCHF_2$	H	$C(CH_3)_3$
350.	CF_3	Br	H	C_6H_5
351.	CF_3	OCH_3	H	C_6H_5
352.	CF_3	Cl	H	C_6H_5
353.	CF_3	F	H	C_6H_5
354.	CF_3	CH_3	H	C_6H_5
355.	CF_3	C_2H_5	H	C_6H_5
356.	CF_3	CF_3	H	C_6H_5
357.	CF_3	OCF_3	H	C_6H_5
358.	CF_3	$OCHF_2$	H	C_6H_5
359.	CF_3	Br	H	cyclopropyl
360.	CF_3	OCH_3	H	cyclopropyl
361.	CF_3	Cl	H	cyclopropyl
362.	CF_3	F	H	cyclopropyl
363.	CF_3	CH_3	H	cyclopropyl
364.	CF_3	C_2H_5	H	cyclopropyl
365.	CF_3	CF_3	H	cyclopropyl
366.	CF_3	OCF_3	H	cyclopropyl
367.	CF_3	$OCHF_2$	H	cyclopropyl
368.	CF_3	Br	H	CH_2-cyclopropyl
369.	CF_3	OCH_3	H	CH_2-cyclopropyl
370.	CF_3	Cl	H	CH_2-cyclopropyl
371.	CF_3	F	H	CH_2-cyclopropyl
372.	CF_3	CH_3	H	CH_2-cyclopropyl
373.	CF_3	C_2H_5	H	CH_2-cyclopropyl
374.	CF_3	CF_3	H	CH_2-cyclopropyl
375.	CF_3	OCF_3	H	CH_2-cyclopropyl
376.	CF_3	$OCHF_2$	H	CH_2-cyclopropyl
377.	CF_3	Br	H	cyclobutyl
378.	CF_3	OCH_3	H	cyclobutyl
379.	CF_3	Cl	H	cyclobutyl

No.	R^b	R^c	R^d	R^2
380.	CF_3	F	H	cyclobutyl
381.	CF_3	CH_3	H	cyclobutyl
382.	CF_3	C_2H_5	H	cyclobutyl
383.	CF_3	CF_3	H	cyclobutyl
384.	CF_3	OCF_3	H	cyclobutyl
385.	CF_3	$OCHF_2$	H	cyclobutyl
386.	CF_3	Br	H	cyclopentyl
387.	CF_3	OCH_3	H	cyclopentyl
388.	CF_3	Cl	H	cyclopentyl
389.	CF_3	F	H	cyclopentyl
390.	CF_3	CH_3	H	cyclopentyl
391.	CF_3	C_2H_5	H	cyclopentyl
392.	CF_3	CF_3	H	cyclopentyl
393.	CF_3	OCF_3	H	cyclopentyl
394.	CF_3	$OCHF_2$	H	cyclopentyl
395.	CF_3	Br	H	cyclohexyl
396.	CF_3	OCH_3	H	cyclohexyl
397.	CF_3	Cl	H	cyclohexyl
398.	CF_3	F	H	cyclohexyl
399.	CF_3	CH_3	H	cyclohexyl
400.	CF_3	C_2H_5	H	cyclohexyl
401.	CF_3	CF_3	H	cyclohexyl
402.	CF_3	OCF_3	H	cyclohexyl
403.	CF_3	$OCHF_2$	H	cyclohexyl
404.	CF_3	H	Br	H
405.	CF_3	H	OCH_3	H
406.	CF_3	H	Cl	H
407.	CF_3	H	F	H
408.	CF_3	H	CH_3	H
409.	CF_3	H	C_2H_5	H
410.	CF_3	H	CF_3	H
411.	CF_3	H	OCF_3	H
412.	CF_3	H	$OCHF_2$	H
413.	CF_3	H	Br	CH_3
414.	CF_3	H	OCH_3	CH_3
415.	CF_3	H	Cl	CH_3
416.	CF_3	H	F	CH_3
417.	CF_3	H	CH_3	CH_3
418.	CF_3	H	C_2H_5	CH_3
419.	CF_3	H	CF_3	CH_3
420.	CF_3	H	OCF_3	CH_3
421.	CF_3	H	$OCHF_2$	CH_3
422.	CF_3	H	Br	C_2H_5
423.	CF_3	H	OCH_3	C_2H_5
424.	CF_3	H	Cl	C_2H_5
425.	CF_3	H	F	C_2H_5
426.	CF_3	H	CH_3	C_2H_5
427.	CF_3	H	C_2H_5	C_2H_5
428.	CF_3	H	CF_3	C_2H_5
429.	CF_3	H	OCF_3	C_2H_5
430.	CF_3	H	$OCHF_2$	C_2H_5

No.	R^b	R^c	R^d	R^2
431.	CF_3	H	Br	$n-C_3H_7$
432.	CF_3	H	OCH_3	$n-C_3H_7$
433.	CF_3	H	Cl	$n-C_3H_7$
434.	CF_3	H	F	$n-C_3H_7$
435.	CF_3	H	CH_3	$n-C_3H_7$
436.	CF_3	H	C_2H_5	$n-C_3H_7$
437.	CF_3	H	CF_3	$n-C_3H_7$
438.	CF_3	H	OCF_3	$n-C_3H_7$
439.	CF_3	H	$OCHF_2$	$n-C_3H_7$
440.	CF_3	H	Br	$CH(CH_3)_2$
441.	CF_3	H	OCH_3	$CH(CH_3)_2$
442.	CF_3	H	Cl	$CH(CH_3)_2$
443.	CF_3	H	F	$CH(CH_3)_2$
444.	CF_3	H	CH_3	$CH(CH_3)_2$
445.	CF_3	H	C_2H_5	$CH(CH_3)_2$
446.	CF_3	H	CF_3	$CH(CH_3)_2$
447.	CF_3	H	OCF_3	$CH(CH_3)_2$
448.	CF_3	H	$OCHF_2$	$CH(CH_3)_2$
449.	CF_3	H	Br	$n-C_4H_9$
450.	CF_3	H	OCH_3	$n-C_4H_9$
451.	CF_3	H	Cl	$n-C_4H_9$
452.	CF_3	H	F	$n-C_4H_9$
453.	CF_3	H	CH_3	$n-C_4H_9$
454.	CF_3	H	C_2H_5	$n-C_4H_9$
455.	CF_3	H	CF_3	$n-C_4H_9$
456.	CF_3	H	OCF_3	$n-C_4H_9$
457.	CF_3	H	$OCHF_2$	$n-C_4H_9$
458.	CF_3	H	Br	$C(CH_3)_3$
459.	CF_3	H	OCH_3	$C(CH_3)_3$
460.	CF_3	H	Cl	$C(CH_3)_3$
461.	CF_3	H	F	$C(CH_3)_3$
462.	CF_3	H	CH_3	$C(CH_3)_3$
463.	CF_3	H	C_2H_5	$C(CH_3)_3$
464.	CF_3	H	CF_3	$C(CH_3)_3$
465.	CF_3	H	OCF_3	$C(CH_3)_3$
466.	CF_3	H	$OCHF_2$	$C(CH_3)_3$
467.	CF_3	H	Br	C_6H_5
468.	CF_3	H	OCH_3	C_6H_5
469.	CF_3	H	Cl	C_6H_5
470.	CF_3	H	F	C_6H_5
471.	CF_3	H	CH_3	C_6H_5
472.	CF_3	H	C_2H_5	C_6H_5
473.	CF_3	H	CF_3	C_6H_5
474.	CF_3	H	OCF_3	C_6H_5
475.	CF_3	H	$OCHF_2$	C_6H_5
476.	CF_3	H	Br	cyclopropyl
477.	CF_3	H	OCH_3	cyclopropyl
478.	CF_3	H	Cl	cyclopropyl
479.	CF_3	H	F	cyclopropyl
480.	CF_3	H	CH_3	cyclopropyl
481.	CF_3	H	C_2H_5	cyclopropyl

No.	R^b	R^c	R^d	R^2
482.	CF_3	H	CF_3	cyclopropyl
483.	CF_3	H	OCF_3	cyclopropyl
484.	CF_3	H	$OCHF_2$	cyclopropyl
485.	CF_3	H	Br	CH_2-cyclopropyl
486.	CF_3	H	OCH_3	CH_2-cyclopropyl
487.	CF_3	H	Cl	CH_2-cyclopropyl
488.	CF_3	H	F	CH_2-cyclopropyl
489.	CF_3	H	CH_3	CH_2-cyclopropyl
490.	CF_3	H	C_2H_5	CH_2-cyclopropyl
491.	CF_3	H	CF_3	CH_2-cyclopropyl
492.	CF_3	H	OCF_3	CH_2-cyclopropyl
493.	CF_3	H	$OCHF_2$	CH_2-cyclopropyl
494.	CF_3	H	Br	cyclobutyl
495.	CF_3	H	OCH_3	cyclobutyl
496.	CF_3	H	Cl	cyclobutyl
497.	CF_3	H	F	cyclobutyl
498.	CF_3	H	CH_3	cyclobutyl
499.	CF_3	H	C_2H_5	cyclobutyl
500.	CF_3	H	CF_3	cyclobutyl
501.	CF_3	H	OCF_3	cyclobutyl
502.	CF_3	H	$OCHF_2$	cyclobutyl
503.	CF_3	H	Br	cyclopentyl
504.	CF_3	H	OCH_3	cyclopentyl
505.	CF_3	H	Cl	cyclopentyl
506.	CF_3	H	F	cyclopentyl
507.	CF_3	H	CH_3	cyclopentyl
508.	CF_3	H	C_2H_5	cyclopentyl
509.	CF_3	H	CF_3	cyclopentyl
510.	CF_3	H	OCF_3	cyclopentyl
511.	CF_3	H	$OCHF_2$	cyclopentyl
512.	CF_3	H	Br	cyclohexyl
513.	CF_3	H	OCH_3	cyclohexyl
514.	CF_3	H	Cl	cyclohexyl
515.	CF_3	H	F	cyclohexyl
516.	CF_3	H	CH_3	cyclohexyl
517.	CF_3	H	C_2H_5	cyclohexyl
518.	CF_3	H	CF_3	cyclohexyl
519.	CF_3	H	OCF_3	cyclohexyl
520.	CF_3	H	$OCHF_2$	cyclohexyl
521.	OCF_3	Br	H	H
522.	OCF_3	OCH_3	H	H
523.	OCF_3	Cl	H	H
524.	OCF_3	F	H	H
525.	OCF_3	CH_3	H	H
526.	OCF_3	C_2H_5	H	H
527.	OCF_3	CF_3	H	H
528.	OCF_3	OCF_3	H	H
529.	OCF_3	$OCHF_2$	H	H
530.	OCF_3	Br	H	CH_3
531.	OCF_3	OCH_3	H	CH_3
532.	OCF_3	Cl	H	CH_3

No.	R^b	R^c	R^d	R^2
533.	OCF_3	F	H	CH_3
534.	OCF_3	CH_3	H	CH_3
535.	OCF_3	C_2H_5	H	CH_3
536.	OCF_3	CF_3	H	CH_3
537.	OCF_3	OCF_3	H	CH_3
538.	OCF_3	$OCHF_2$	H	CH_3
539.	OCF_3	Br	H	C_2H_5
540.	OCF_3	OCH_3	H	C_2H_5
541.	OCF_3	Cl	H	C_2H_5
542.	OCF_3	F	H	C_2H_5
543.	OCF_3	CH_3	H	C_2H_5
544.	OCF_3	C_2H_5	H	C_2H_5
545.	OCF_3	CF_3	H	C_2H_5
546.	OCF_3	OCF_3	H	C_2H_5
547.	OCF_3	$OCHF_2$	H	C_2H_5
548.	OCF_3	Br	H	$n\text{-}C_3H_7$
549.	OCF_3	OCH_3	H	$n\text{-}C_3H_7$
550.	OCF_3	Cl	H	$n\text{-}C_3H_7$
551.	OCF_3	F	H	$n\text{-}C_3H_7$
552.	OCF_3	CH_3	H	$n\text{-}C_3H_7$
553.	OCF_3	C_2H_5	H	$n\text{-}C_3H_7$
554.	OCF_3	CF_3	H	$n\text{-}C_3H_7$
555.	OCF_3	OCF_3	H	$n\text{-}C_3H_7$
556.	OCF_3	$OCHF_2$	H	$n\text{-}C_3H_7$
557.	OCF_3	Br	H	$CH(CH_3)_2$
558.	OCF_3	OCH_3	H	$CH(CH_3)_2$
559.	OCF_3	Cl	H	$CH(CH_3)_2$
560.	OCF_3	F	H	$CH(CH_3)_2$
561.	OCF_3	CH_3	H	$CH(CH_3)_2$
562.	OCF_3	C_2H_5	H	$CH(CH_3)_2$
563.	OCF_3	CF_3	H	$CH(CH_3)_2$
564.	OCF_3	OCF_3	H	$CH(CH_3)_2$
565.	OCF_3	$OCHF_2$	H	$CH(CH_3)_2$
566.	OCF_3	Br	H	$n\text{-}C_4H_9$
567.	OCF_3	OCH_3	H	$n\text{-}C_4H_9$
568.	OCF_3	Cl	H	$n\text{-}C_4H_9$
569.	OCF_3	F	H	$n\text{-}C_4H_9$
570.	OCF_3	CH_3	H	$n\text{-}C_4H_9$
571.	OCF_3	C_2H_5	H	$n\text{-}C_4H_9$
572.	OCF_3	CF_3	H	$n\text{-}C_4H_9$
573.	OCF_3	OCF_3	H	$n\text{-}C_4H_9$
574.	OCF_3	$OCHF_2$	H	$n\text{-}C_4H_9$
575.	OCF_3	Br	H	$C(CH_3)_3$
576.	OCF_3	OCH_3	H	$C(CH_3)_3$
577.	OCF_3	Cl	H	$C(CH_3)_3$
578.	OCF_3	F	H	$C(CH_3)_3$
579.	OCF_3	CH_3	H	$C(CH_3)_3$
580.	OCF_3	C_2H_5	H	$C(CH_3)_3$
581.	OCF_3	CF_3	H	$C(CH_3)_3$
582.	OCF_3	OCF_3	H	$C(CH_3)_3$
583.	OCF_3	$OCHF_2$	H	$C(CH_3)_3$

No.	R^b	R^c	R^d	R^2
584.	OCF_3	Br	H	C_6H_5
585.	OCF_3	OCH_3	H	C_6H_5
586.	OCF_3	Cl	H	C_6H_5
587.	OCF_3	F	H	C_6H_5
588.	OCF_3	CH_3	H	C_6H_5
589.	OCF_3	C_2H_5	H	C_6H_5
590.	OCF_3	CF_3	H	C_6H_5
591.	OCF_3	OCF_3	H	C_6H_5
592.	OCF_3	$OCHF_2$	H	C_6H_5
593.	OCF_3	Br	H	cyclopropyl
594.	OCF_3	OCH_3	H	cyclopropyl
595.	OCF_3	Cl	H	cyclopropyl
596.	OCF_3	F	H	cyclopropyl
597.	OCF_3	CH_3	H	cyclopropyl
598.	OCF_3	C_2H_5	H	cyclopropyl
599.	OCF_3	CF_3	H	cyclopropyl
600.	OCF_3	OCF_3	H	cyclopropyl
601.	OCF_3	$OCHF_2$	H	cyclopropyl
602.	OCF_3	Br	H	CH_2-cyclopropyl
603.	OCF_3	OCH_3	H	CH_2-cyclopropyl
604.	OCF_3	Cl	H	CH_2-cyclopropyl
605.	OCF_3	F	H	CH_2-cyclopropyl
606.	OCF_3	CH_3	H	CH_2-cyclopropyl
607.	OCF_3	C_2H_5	H	CH_2-cyclopropyl
608.	OCF_3	OCF_3	H	CH_2-cyclopropyl
609.	OCF_3	CF_3	H	CH_2-cyclopropyl
610.	OCF_3	$OCHF_2$	H	CH_2-cyclopropyl
611.	OCF_3	Br	H	cyclobutyl
612.	OCF_3	OCH_3	H	cyclobutyl
613.	OCF_3	Cl	H	cyclobutyl
614.	OCF_3	F	H	cyclobutyl
615.	OCF_3	CH_3	H	cyclobutyl
616.	OCF_3	C_2H_5	H	cyclobutyl
617.	OCF_3	OCF_3	H	cyclobutyl
618.	OCF_3	CF_3	H	cyclobutyl
619.	OCF_3	$OCHF_2$	H	cyclobutyl
620.	OCF_3	Br	H	cyclopentyl
621.	OCF_3	OCH_3	H	cyclopentyl
622.	OCF_3	Cl	H	cyclopentyl
623.	OCF_3	F	H	cyclopentyl
624.	OCF_3	CH_3	H	cyclopentyl
625.	OCF_3	C_2H_5	H	cyclopentyl
626.	OCF_3	OCF_3	H	cyclopentyl
627.	OCF_3	CF_3	H	cyclopentyl
628.	OCF_3	$OCHF_2$	H	cyclopentyl
629.	OCF_3	Br	H	cyclohexyl
630.	OCF_3	OCH_3	H	cyclohexyl
631.	OCF_3	Cl	H	cyclohexyl
632.	OCF_3	F	H	cyclohexyl
633.	OCF_3	CH_3	H	cyclohexyl
634.	OCF_3	C_2H_5	H	cyclohexyl

No.	R^b	R^c	R^d	R^2
635.	OCF_3	OCF_3	H	cyclohexyl
636.	OCF_3	CF_3	H	cyclohexyl
637.	OCF_3	$OCHF_2$	H	cyclohexyl
638.	OCF_3	H	Br	H
639.	OCF_3	H	OCH_3	H
640.	OCF_3	H	Cl	H
641.	OCF_3	H	F	H
642.	OCF_3	H	CH_3	H
643.	OCF_3	H	C_2H_5	H
644.	OCF_3	H	CF_3	H
645.	OCF_3	H	OCF_3	H
646.	OCF_3	H	$OCHF_2$	H
647.	OCF_3	H	Br	CH_3
648.	OCF_3	H	OCH_3	CH_3
649.	OCF_3	H	Cl	CH_3
650.	OCF_3	H	F	CH_3
651.	OCF_3	H	CH_3	CH_3
652.	OCF_3	H	C_2H_5	CH_3
653.	OCF_3	H	CF_3	CH_3
654.	OCF_3	H	OCF_3	CH_3
655.	OCF_3	H	$OCHF_2$	CH_3
656.	OCF_3	H	Br	C_2H_5
657.	OCF_3	H	OCH_3	C_2H_5
658.	OCF_3	H	Cl	C_2H_5
659.	OCF_3	H	F	C_2H_5
660.	OCF_3	H	CH_3	C_2H_5
661.	OCF_3	H	C_2H_5	C_2H_5
662.	OCF_3	H	CF_3	C_2H_5
663.	OCF_3	H	OCF_3	C_2H_5
664.	OCF_3	H	$OCHF_2$	C_2H_5
665.	OCF_3	H	Br	n-C_3H_7
666.	OCF_3	H	OCH_3	n-C_3H_7
667.	OCF_3	H	Cl	n-C_3H_7
668.	OCF_3	H	F	n-C_3H_7
669.	OCF_3	H	CH_3	n-C_3H_7
670.	OCF_3	H	C_2H_5	n-C_3H_7
671.	OCF_3	H	CF_3	n-C_3H_7
672.	OCF_3	H	OCF_3	n-C_3H_7
673.	OCF_3	H	$OCHF_2$	n-C_3H_7
674.	OCF_3	H	Br	$CH(CH_3)_2$
675.	OCF_3	H	OCH_3	$CH(CH_3)_2$
676.	OCF_3	H	Cl	$CH(CH_3)_2$
677.	OCF_3	H	F	$CH(CH_3)_2$
678.	OCF_3	H	CH_3	$CH(CH_3)_2$
679.	OCF_3	H	C_2H_5	$CH(CH_3)_2$
680.	OCF_3	H	CF_3	$CH(CH_3)_2$
681.	OCF_3	H	OCF_3	$CH(CH_3)_2$
682.	OCF_3	H	$OCHF_2$	$CH(CH_3)_2$
683.	OCF_3	H	Br	n-C_4H_9
684.	OCF_3	H	OCH_3	n-C_4H_9
685.	OCF_3	H	Cl	n-C_4H_9

No.	R^b	R^c	R^d	R^2
686.	OCF_3	H	F	n-C_4H_9
687.	OCF_3	H	CH_3	n-C_4H_9
688.	OCF_3	H	C_2H_5	n-C_4H_9
689.	OCF_3	H	CF_3	n-C_4H_9
690.	OCF_3	H	OCF_3	n-C_4H_9
691.	OCF_3	H	$OCHF_2$	n-C_4H_9
692.	OCF_3	H	Br	$C(CH_3)_3$
693.	OCF_3	H	OCH_3	$C(CH_3)_3$
694.	OCF_3	H	Cl	$C(CH_3)_3$
695.	OCF_3	H	F	$C(CH_3)_3$
696.	OCF_3	H	CH_3	$C(CH_3)_3$
697.	OCF_3	H	C_2H_5	$C(CH_3)_3$
698.	OCF_3	H	CF_3	$C(CH_3)_3$
699.	OCF_3	H	OCF_3	$C(CH_3)_3$
700.	OCF_3	H	$OCHF_2$	$C(CH_3)_3$
701.	OCF_3	H	Br	C_6H_5
702.	OCF_3	H	OCH_3	C_6H_5
703.	OCF_3	H	Cl	C_6H_5
704.	OCF_3	H	F	C_6H_5
705.	OCF_3	H	CH_3	C_6H_5
706.	OCF_3	H	C_2H_5	C_6H_5
707.	OCF_3	H	CF_3	C_6H_5
708.	OCF_3	H	OCF_3	C_6H_5
709.	OCF_3	H	$OCHF_2$	C_6H_5
710.	OCF_3	H	Br	cyclopropyl
711.	OCF_3	H	OCH_3	cyclopropyl
712.	OCF_3	H	Cl	cyclopropyl
713.	OCF_3	H	F	cyclopropyl
714.	OCF_3	H	CH_3	cyclopropyl
715.	OCF_3	H	C_2H_5	cyclopropyl
716.	OCF_3	H	CF_3	cyclopropyl
717.	OCF_3	H	OCF_3	cyclopropyl
718.	OCF_3	H	$OCHF_2$	cyclopropyl
719.	OCF_3	H	Br	CH_2-cyclopropyl
720.	OCF_3	H	OCH_3	CH_2-cyclopropyl
721.	OCF_3	H	Cl	CH_2-cyclopropyl
722.	OCF_3	H	F	CH_2-cyclopropyl
723.	OCF_3	H	CH_3	CH_2-cyclopropyl
724.	OCF_3	H	C_2H_5	CH_2-cyclopropyl
725.	OCF_3	H	CF_3	CH_2-cyclopropyl
726.	OCF_3	H	OCF_3	CH_2-cyclopropyl
727.	OCF_3	H	$OCHF_2$	CH_2-cyclopropyl
728.	OCF_3	H	Br	cyclobutyl
729.	OCF_3	H	OCH_3	cyclobutyl
730.	OCF_3	H	Cl	cyclobutyl
731.	OCF_3	H	F	cyclobutyl
732.	OCF_3	H	CH_3	cyclobutyl
733.	OCF_3	H	C_2H_5	cyclobutyl
734.	OCF_3	H	CF_3	cyclobutyl
735.	OCF_3	H	OCF_3	cyclobutyl
736.	OCF_3	H	$OCHF_2$	cyclobutyl

No.	R^b	R^c	R^d	R^2
737.	OCF_3	H	Br	cyclopentyl
738.	OCF_3	H	OCH_3	cyclopentyl
739.	OCF_3	H	Cl	cyclopentyl
740.	OCF_3	H	F	cyclopentyl
741.	OCF_3	H	CH_3	cyclopentyl
742.	OCF_3	H	C_2H_5	cyclopentyl
743.	OCF_3	H	CF_3	cyclopentyl
744.	OCF_3	H	OCF_3	cyclopentyl
745.	OCF_3	H	$OCHF_2$	cyclopentyl
746.	OCF_3	H	Br	cyclohexyl
747.	OCF_3	H	OCH_3	cyclohexyl
748.	OCF_3	H	Cl	cyclohexyl
749.	OCF_3	H	F	cyclohexyl
750.	OCF_3	H	CH_3	cyclohexyl
751.	OCF_3	H	C_2H_5	cyclohexyl
752.	OCF_3	H	CF_3	cyclohexyl
753.	OCF_3	H	OCF_3	cyclohexyl
754.	OCF_3	H	$OCHF_2$	cyclohexyl
755.	$OCHF_2$	Br	H	H
756.	$OCHF_2$	OCH_3	H	H
757.	$OCHF_2$	Cl	H	H
758.	$OCHF_2$	F	H	H
759.	$OCHF_2$	CH_3	H	H
760.	$OCHF_2$	C_2H_5	H	H
761.	$OCHF_2$	OCF_3	H	H
762.	$OCHF_2$	CF_3	H	H
763.	$OCHF_2$	Br	H	CH_3
764.	$OCHF_2$	OCH_3	H	CH_3
765.	$OCHF_2$	Cl	H	CH_3
766.	$OCHF_2$	F	H	CH_3
767.	$OCHF_2$	CH_3	H	CH_3
768.	$OCHF_2$	C_2H_5	H	CH_3
769.	$OCHF_2$	OCF_3	H	CH_3
770.	$OCHF_2$	CF_3	H	CH_3
771.	$OCHF_2$	Br	H	C_2H_5
772.	$OCHF_2$	OCH_3	H	C_2H_5
773.	$OCHF_2$	Cl	H	C_2H_5
774.	$OCHF_2$	F	H	C_2H_5
775.	$OCHF_2$	CH_3	H	C_2H_5
776.	$OCHF_2$	C_2H_5	H	C_2H_5
777.	$OCHF_2$	OCF_3	H	C_2H_5
778.	$OCHF_2$	CF_3	H	C_2H_5
779.	$OCHF_2$	Br	H	$n\text{-}C_3H_7$
780.	$OCHF_2$	OCH_3	H	$n\text{-}C_3H_7$
781.	$OCHF_2$	Cl	H	$n\text{-}C_3H_7$
782.	$OCHF_2$	F	H	$n\text{-}C_3H_7$
783.	$OCHF_2$	CH_3	H	$n\text{-}C_3H_7$
784.	$OCHF_2$	C_2H_5	H	$n\text{-}C_3H_7$
785.	$OCHF_2$	OCF_3	H	$n\text{-}C_3H_7$
786.	$OCHF_2$	CF_3	H	$n\text{-}C_3H_7$
787.	$OCHF_2$	Br	H	$CH(CH_3)_2$

No.	R^b	R^c	R^d	R^2
788.	$OCHF_2$	OCH_3	H	$CH(CH_3)_2$
789.	$OCHF_2$	Cl	H	$CH(CH_3)_2$
790.	$OCHF_2$	F	H	$CH(CH_3)_2$
791.	$OCHF_2$	CH_3	H	$CH(CH_3)_2$
792.	$OCHF_2$	C_2H_5	H	$CH(CH_3)_2$
793.	$OCHF_2$	OCF_3	H	$CH(CH_3)_2$
794.	$OCHF_2$	CF_3	H	$CH(CH_3)_2$
795.	$OCHF_2$	Br	H	n-C_4H_9
796.	$OCHF_2$	OCH_3	H	n-C_4H_9
797.	$OCHF_2$	Cl	H	n-C_4H_9
798.	$OCHF_2$	F	H	n-C_4H_9
799.	$OCHF_2$	CH_3	H	n-C_4H_9
800.	$OCHF_2$	C_2H_5	H	n-C_4H_9
801.	$OCHF_2$	OCF_3	H	n-C_4H_9
802.	$OCHF_2$	CF_3	H	n-C_4H_9
803.	$OCHF_2$	Br	H	$C(CH_3)_3$
804.	$OCHF_2$	OCH_3	H	$C(CH_3)_3$
805.	$OCHF_2$	Cl	H	$C(CH_3)_3$
806.	$OCHF_2$	F	H	$C(CH_3)_3$
807.	$OCHF_2$	CH_3	H	$C(CH_3)_3$
808.	$OCHF_2$	C_2H_5	H	$C(CH_3)_3$
809.	$OCHF_2$	OCF_3	H	$C(CH_3)_3$
810.	$OCHF_2$	CF_3	H	$C(CH_3)_3$
811.	$OCHF_2$	Br	H	C_6H_5
812.	$OCHF_2$	OCH_3	H	C_6H_5
813.	$OCHF_2$	Cl	H	C_6H_5
814.	$OCHF_2$	F	H	C_6H_5
815.	$OCHF_2$	CH_3	H	C_6H_5
816.	$OCHF_2$	C_2H_5	H	C_6H_5
817.	$OCHF_2$	OCF_3	H	C_6H_5
818.	$OCHF_2$	CF_3	H	C_6H_5
819.	$OCHF_2$	Br	H	cyclopropyl
820.	$OCHF_2$	OCH_3	H	cyclopropyl
821.	$OCHF_2$	Cl	H	cyclopropyl
822.	$OCHF_2$	F	H	cyclopropyl
823.	$OCHF_2$	CH_3	H	cyclopropyl
824.	$OCHF_2$	C_2H_5	H	cyclopropyl
825.	$OCHF_2$	OCF_3	H	cyclopropyl
826.	$OCHF_2$	CF_3	H	cyclopropyl
827.	$OCHF_2$	Br	H	CH_2-cyclopropyl
828.	$OCHF_2$	OCH_3	H	CH_2-cyclopropyl
829.	$OCHF_2$	Cl	H	CH_2-cyclopropyl
830.	$OCHF_2$	F	H	CH_2-cyclopropyl
831.	$OCHF_2$	CH_3	H	CH_2-cyclopropyl
832.	$OCHF_2$	C_2H_5	H	CH_2-cyclopropyl
833.	$OCHF_2$	OCF_3	H	CH_2-cyclopropyl
834.	$OCHF_2$	CF_3	H	CH_2-cyclopropyl
835.	$OCHF_2$	Br	H	cyclobutyl
836.	$OCHF_2$	OCH_3	H	cyclobutyl
837.	$OCHF_2$	Cl	H	cyclobutyl
838.	$OCHF_2$	F	H	cyclobutyl

No.	R^b	R^c	R^d	R^2
839.	$OCHF_2$	CH_3	H	cyclobutyl
840.	$OCHF_2$	C_2H_5	H	cyclobutyl
841.	$OCHF_2$	OCF_3	H	cyclobutyl
842.	$OCHF_2$	CF_3	H	cyclobutyl
843.	$OCHF_2$	Br	H	cyclopentyl
844.	$OCHF_2$	OCH_3	H	cyclopentyl
845.	$OCHF_2$	Cl	H	cyclopentyl
846.	$OCHF_2$	F	H	cyclopentyl
847.	$OCHF_2$	CH_3	H	cyclopentyl
848.	$OCHF_2$	C_2H_5	H	cyclopentyl
849.	$OCHF_2$	OCF_3	H	cyclopentyl
850.	$OCHF_2$	CF_3	H	cyclopentyl
851.	$OCHF_2$	Br	H	cyclohexyl
852.	$OCHF_2$	OCH_3	H	cyclohexyl
853.	$OCHF_2$	Cl	H	cyclohexyl
854.	$OCHF_2$	F	H	cyclohexyl
855.	$OCHF_2$	CH_3	H	cyclohexyl
856.	$OCHF_2$	C_2H_5	H	cyclohexyl
857.	$OCHF_2$	OCF_3	H	cyclohexyl
858.	$OCHF_2$	CF_3	H	cyclohexyl
859.	$OCHF_2$	H	Br	H
860.	$OCHF_2$	H	OCH_3	H
861.	$OCHF_2$	H	Cl	H
862.	$OCHF_2$	H	F	H
863.	$OCHF_2$	H	CH_3	H
864.	$OCHF_2$	H	C_2H_5	H
865.	$OCHF_2$	H	OCF_3	H
866.	$OCHF_2$	H	CF_3	H
867.	$OCHF_2$	H	Br	CH_3
868.	$OCHF_2$	H	OCH_3	CH_3
869.	$OCHF_2$	H	Cl	CH_3
870.	$OCHF_2$	H	F	CH_3
871.	$OCHF_2$	H	CH_3	CH_3
872.	$OCHF_2$	H	C_2H_5	CH_3
873.	$OCHF_2$	H	OCF_3	CH_3
874.	$OCHF_2$	H	CF_3	CH_3
875.	$OCHF_2$	H	Br	C_2H_5
876.	$OCHF_2$	H	OCH_3	C_2H_5
877.	$OCHF_2$	H	Cl	C_2H_5
878.	$OCHF_2$	H	F	C_2H_5
879.	$OCHF_2$	H	CH_3	C_2H_5
880.	$OCHF_2$	H	C_2H_5	C_2H_5
881.	$OCHF_2$	H	OCF_3	C_2H_5
882.	$OCHF_2$	H	CF_3	C_2H_5
883.	$OCHF_2$	H	Br	$n\text{-}C_3H_7$
884.	$OCHF_2$	H	OCH_3	$n\text{-}C_3H_7$
885.	$OCHF_2$	H	Cl	$n\text{-}C_3H_7$
886.	$OCHF_2$	H	F	$n\text{-}C_3H_7$
887.	$OCHF_2$	H	CH_3	$n\text{-}C_3H_7$
888.	$OCHF_2$	H	C_2H_5	$n\text{-}C_3H_7$
889.	$OCHF_2$	H	OCF_3	$n\text{-}C_3H_7$

No.	R^b	R^c	R^d	R^2
890.	$OCHF_2$	H	CF_3	n-C_3H_7
891.	$OCHF_2$	H	Br	$CH(CH_3)_2$
892.	$OCHF_2$	H	OCH_3	$CH(CH_3)_2$
893.	$OCHF_2$	H	Cl	$CH(CH_3)_2$
894.	$OCHF_2$	H	F	$CH(CH_3)_2$
895.	$OCHF_2$	H	CH_3	$CH(CH_3)_2$
896.	$OCHF_2$	H	C_2H_5	$CH(CH_3)_2$
897.	$OCHF_2$	H	OCF_3	$CH(CH_3)_2$
898.	$OCHF_2$	H	CF_3	$CH(CH_3)_2$
899.	$OCHF_2$	H	Br	n-C_4H_9
900.	$OCHF_2$	H	OCH_3	n-C_4H_9
901.	$OCHF_2$	H	Cl	n-C_4H_9
902.	$OCHF_2$	H	F	n-C_4H_9
903.	$OCHF_2$	H	CH_3	n-C_4H_9
904.	$OCHF_2$	H	C_2H_5	n-C_4H_9
905.	$OCHF_2$	H	OCF_3	n-C_4H_9
906.	$OCHF_2$	H	CF_3	n-C_4H_9
907.	$OCHF_2$	H	Br	$C(CH_3)_3$
908.	$OCHF_2$	H	OCH_3	$C(CH_3)_3$
909.	$OCHF_2$	H	Cl	$C(CH_3)_3$
910.	$OCHF_2$	H	F	$C(CH_3)_3$
911.	$OCHF_2$	H	CH_3	$C(CH_3)_3$
912.	$OCHF_2$	H	C_2H_5	$C(CH_3)_3$
913.	$OCHF_2$	H	OCF_3	$C(CH_3)_3$
914.	$OCHF_2$	H	CF_3	$C(CH_3)_3$
915.	$OCHF_2$	H	Br	C_6H_5
916.	$OCHF_2$	H	OCH_3	C_6H_5
917.	$OCHF_2$	H	Cl	C_6H_5
918.	$OCHF_2$	H	F	C_6H_5
919.	$OCHF_2$	H	CH_3	C_6H_5
920.	$OCHF_2$	H	C_2H_5	C_6H_5
921.	$OCHF_2$	H	OCF_3	C_6H_5
922.	$OCHF_2$	H	CF_3	C_6H_5
923.	$OCHF_2$	H	Br	cyclopropyl
924.	$OCHF_2$	H	OCH_3	cyclopropyl
925.	$OCHF_2$	H	Cl	cyclopropyl
926.	$OCHF_2$	H	F	cyclopropyl
927.	$OCHF_2$	H	CH_3	cyclopropyl
928.	$OCHF_2$	H	C_2H_5	cyclopropyl
929.	$OCHF_2$	H	OCF_3	cyclopropyl
930.	$OCHF_2$	H	CF_3	cyclopropyl
931.	$OCHF_2$	H	Br	CH_2-cyclopropyl
932.	$OCHF_2$	H	OCH_3	CH_2-cyclopropyl
933.	$OCHF_2$	H	Cl	CH_2-cyclopropyl
934.	$OCHF_2$	H	F	CH_2-cyclopropyl
935.	$OCHF_2$	H	CH_3	CH_2-cyclopropyl
936.	$OCHF_2$	H	C_2H_5	CH_2-cyclopropyl
937.	$OCHF_2$	H	OCF_3	CH_2-cyclopropyl
938.	$OCHF_2$	H	CF_3	CH_2-cyclopropyl
939.	$OCHF_2$	H	Br	cyclobutyl
940.	$OCHF_2$	H	OCH_3	cyclobutyl

No.	R^b	R^c	R^d	R^2
941.	$OCHF_2$	H	Cl	cyclobutyl
942.	$OCHF_2$	H	F	cyclobutyl
943.	$OCHF_2$	H	CH_3	cyclobutyl
944.	$OCHF_2$	H	C_2H_5	cyclobutyl
945.	$OCHF_2$	H	OCF_3	cyclobutyl
946.	$OCHF_2$	H	CF_3	cyclobutyl
947.	$OCHF_2$	H	Br	cyclopentyl
948.	$OCHF_2$	H	OCH_3	cyclopentyl
949.	$OCHF_2$	H	Cl	cyclopentyl
950.	$OCHF_2$	H	F	cyclopentyl
951.	$OCHF_2$	H	CH_3	cyclopentyl
952.	$OCHF_2$	H	C_2H_5	cyclopentyl
953.	$OCHF_2$	H	OCF_3	cyclopentyl
954.	$OCHF_2$	H	CF_3	cyclopentyl
955.	$OCHF_2$	H	Br	cyclohexyl
956.	$OCHF_2$	H	OCH_3	cyclohexyl
957.	$OCHF_2$	H	Cl	cyclohexyl
958.	$OCHF_2$	H	F	cyclohexyl
959.	$OCHF_2$	H	CH_3	cyclohexyl
960.	$OCHF_2$	H	C_2H_5	cyclohexyl
961.	$OCHF_2$	H	OCF_3	cyclohexyl
962.	$OCHF_2$	H	CF_3	cyclohexyl
963.	OCH_3	Br	H	H
964.	OCH_3	OCH_3	H	H
965.	OCH_3	Cl	H	H
966.	OCH_3	F	H	H
967.	OCH_3	CH_3	H	H
968.	OCH_3	C_2H_5	H	H
969.	OCH_3	CF_3	H	H
970.	OCH_3	OCF_3	H	H
971.	OCH_3	$OCHF_2$	H	H
972.	OCH_3	Br	H	CH_3
973.	OCH_3	OCH_3	H	CH_3
974.	OCH_3	Cl	H	CH_3
975.	OCH_3	F	H	CH_3
976.	OCH_3	CH_3	H	CH_3
977.	OCH_3	C_2H_5	H	CH_3
978.	OCH_3	CF_3	H	CH_3
979.	OCH_3	OCF_3	H	CH_3
980.	OCH_3	$OCHF_2$	H	CH_3
981.	OCH_3	Br	H	C_2H_5
982.	OCH_3	OCH_3	H	C_2H_5
983.	OCH_3	Cl	H	C_2H_5
984.	OCH_3	F	H	C_2H_5
985.	OCH_3	CH_3	H	C_2H_5
986.	OCH_3	C_2H_5	H	C_2H_5
987.	OCH_3	CF_3	H	C_2H_5
988.	OCH_3	OCF_3	H	C_2H_5
989.	OCH_3	$OCHF_2$	H	C_2H_5
990.	OCH_3	Br	H	n-C_3H_7
991.	OCH_3	OCH_3	H	n-C_3H_7

No.	R^b	R^c	R^d	R^2
992.	OCH_3	Cl	H	$n-C_3H_7$
993.	OCH_3	F	H	$n-C_3H_7$
994.	OCH_3	CH_3	H	$n-C_3H_7$
995.	OCH_3	C_2H_5	H	$n-C_3H_7$
996.	OCH_3	CF_3	H	$n-C_3H_7$
997.	OCH_3	OCF_3	H	$n-C_3H_7$
998.	OCH_3	$OCHF_2$	H	$n-C_3H_7$
999.	OCH_3	Br	H	$CH(CH_3)_2$
1000.	OCH_3	OCH_3	H	$CH(CH_3)_2$
1001.	OCH_3	Cl	H	$CH(CH_3)_2$
1002.	OCH_3	F	H	$CH(CH_3)_2$
1003.	OCH_3	CH_3	H	$CH(CH_3)_2$
1004.	OCH_3	C_2H_5	H	$CH(CH_3)_2$
1005.	OCH_3	CF_3	H	$CH(CH_3)_2$
1006.	OCH_3	OCF_3	H	$CH(CH_3)_2$
1007.	OCH_3	$OCHF_2$	H	$CH(CH_3)_2$
1008.	OCH_3	Br	H	$n-C_4H_9$
1009.	OCH_3	OCH_3	H	$n-C_4H_9$
1010.	OCH_3	Cl	H	$n-C_4H_9$
1011.	OCH_3	F	H	$n-C_4H_9$
1012.	OCH_3	CH_3	H	$n-C_4H_9$
1013.	OCH_3	C_2H_5	H	$n-C_4H_9$
1014.	OCH_3	CF_3	H	$n-C_4H_9$
1015.	OCH_3	OCF_3	H	$n-C_4H_9$
1016.	OCH_3	$OCHF_2$	H	$n-C_4H_9$
1017.	OCH_3	Br	H	$C(CH_3)_3$
1018.	OCH_3	OCH_3	H	$C(CH_3)_3$
1019.	OCH_3	Cl	H	$C(CH_3)_3$
1020.	OCH_3	F	H	$C(CH_3)_3$
1021.	OCH_3	CH_3	H	$C(CH_3)_3$
1022.	OCH_3	C_2H_5	H	$C(CH_3)_3$
1023.	OCH_3	CF_3	H	$C(CH_3)_3$
1024.	OCH_3	OCF_3	H	$C(CH_3)_3$
1025.	OCH_3	$OCHF_2$	H	$C(CH_3)_3$
1026.	OCH_3	Br	H	C_6H_5
1027.	OCH_3	OCH_3	H	C_6H_5
1028.	OCH_3	Cl	H	C_6H_5
1029.	OCH_3	F	H	C_6H_5
1030.	OCH_3	CH_3	H	C_6H_5
1031.	OCH_3	C_2H_5	H	C_6H_5
1032.	OCH_3	CF_3	H	C_6H_5
1033.	OCH_3	OCF_3	H	C_6H_5
1034.	OCH_3	$OCHF_2$	H	C_6H_5
1035.	OCH_3	Br	H	cyclopropyl
1036.	OCH_3	OCH_3	H	cyclopropyl
1037.	OCH_3	Cl	H	cyclopropyl
1038.	OCH_3	F	H	cyclopropyl
1039.	OCH_3	CH_3	H	cyclopropyl
1040.	OCH_3	C_2H_5	H	cyclopropyl
1041.	OCH_3	CF_3	H	cyclopropyl
1042.	OCH_3	OCF_3	H	cyclopropyl

No.	R^b	R^c	R^d	R^2
1043.	OCH_3	$OCHF_2$	H	cyclopropyl
1044.	OCH_3	Br	H	CH_2-cyclopropyl
1045.	OCH_3	OCH_3	H	CH_2-cyclopropyl
1046.	OCH_3	Cl	H	CH_2-cyclopropyl
1047.	OCH_3	F	H	CH_2-cyclopropyl
1048.	OCH_3	CH_3	H	CH_2-cyclopropyl
1049.	OCH_3	C_2H_5	H	CH_2-cyclopropyl
1050.	OCH_3	CF_3	H	CH_2-cyclopropyl
1051.	OCH_3	OCF_3	H	CH_2-cyclopropyl
1052.	OCH_3	$OCHF_2$	H	CH_2-cyclopropyl
1053.	OCH_3	Br	H	cyclobutyl
1054.	OCH_3	OCH_3	H	cyclobutyl
1055.	OCH_3	Cl	H	cyclobutyl
1056.	OCH_3	F	H	cyclobutyl
1057.	OCH_3	CH_3	H	cyclobutyl
1058.	OCH_3	C_2H_5	H	cyclobutyl
1059.	OCH_3	CF_3	H	cyclobutyl
1060.	OCH_3	OCF_3	H	cyclobutyl
1061.	OCH_3	$OCHF_2$	H	cyclobutyl
1062.	OCH_3	Br	H	cyclopentyl
1063.	OCH_3	OCH_3	H	cyclopentyl
1064.	OCH_3	Cl	H	cyclopentyl
1065.	OCH_3	F	H	cyclopentyl
1066.	OCH_3	CH_3	H	cyclopentyl
1067.	OCH_3	C_2H_5	H	cyclopentyl
1068.	OCH_3	CF_3	H	cyclopentyl
1069.	OCH_3	OCF_3	H	cyclopentyl
1070.	OCH_3	$OCHF_2$	H	cyclopentyl
1071.	OCH_3	Br	H	cyclohexyl
1072.	OCH_3	OCH_3	H	cyclohexyl
1073.	OCH_3	Cl	H	cyclohexyl
1074.	OCH_3	F	H	cyclohexyl
1075.	OCH_3	CH_3	H	cyclohexyl
1076.	OCH_3	C_2H_5	H	cyclohexyl
1077.	OCH_3	CF_3	H	cyclohexyl
1078.	OCH_3	OCF_3	H	cyclohexyl
1079.	OCH_3	$OCHF_2$	H	cyclohexyl
1080.	OCH_3	H	Br	H
1081.	OCH_3	H	OCH_3	H
1082.	OCH_3	H	Cl	H
1083.	OCH_3	H	F	H
1084.	OCH_3	H	CH_3	H
1085.	OCH_3	H	C_2H_5	H
1086.	OCH_3	H	CF_3	H
1087.	OCH_3	H	OCF_3	H
1088.	OCH_3	H	$OCHF_2$	H
1089.	OCH_3	H	Br	CH_3
1090.	OCH_3	H	OCH_3	CH_3
1091.	OCH_3	H	Cl	CH_3
1092.	OCH_3	H	F	CH_3
1093.	OCH_3	H	CH_3	CH_3

No.	R^b	R^c	R^d	R^2
1094.	OCH_3	H	C_2H_5	CH_3
1095.	OCH_3	H	CF_3	CH_3
1096.	OCH_3	H	OCF_3	CH_3
1097.	OCH_3	H	$OCHF_2$	CH_3
1098.	OCH_3	H	Br	C_2H_5
1099.	OCH_3	H	OCH_3	C_2H_5
1100.	OCH_3	H	Cl	C_2H_5
1101.	OCH_3	H	F	C_2H_5
1102.	OCH_3	H	CH_3	C_2H_5
1103.	OCH_3	H	C_2H_5	C_2H_5
1104.	OCH_3	H	CF_3	C_2H_5
1105.	OCH_3	H	OCF_3	C_2H_5
1106.	OCH_3	H	$OCHF_2$	C_2H_5
1107.	OCH_3	H	Br	$n\text{-}C_3H_7$
1108.	OCH_3	H	OCH_3	$n\text{-}C_3H_7$
1109.	OCH_3	H	Cl	$n\text{-}C_3H_7$
1110.	OCH_3	H	F	$n\text{-}C_3H_7$
1111.	OCH_3	H	CH_3	$n\text{-}C_3H_7$
1112.	OCH_3	H	C_2H_5	$n\text{-}C_3H_7$
1113.	OCH_3	H	CF_3	$n\text{-}C_3H_7$
1114.	OCH_3	H	OCF_3	$n\text{-}C_3H_7$
1115.	OCH_3	H	$OCHF_2$	$n\text{-}C_3H_7$
1116.	OCH_3	H	Br	$CH(CH_3)_2$
1117.	OCH_3	H	OCH_3	$CH(CH_3)_2$
1118.	OCH_3	H	Cl	$CH(CH_3)_2$
1119.	OCH_3	H	F	$CH(CH_3)_2$
1120.	OCH_3	H	CH_3	$CH(CH_3)_2$
1121.	OCH_3	H	C_2H_5	$CH(CH_3)_2$
1122.	OCH_3	H	CF_3	$CH(CH_3)_2$
1123.	OCH_3	H	OCF_3	$CH(CH_3)_2$
1124.	OCH_3	H	$OCHF_2$	$CH(CH_3)_2$
1125.	OCH_3	H	Br	$n\text{-}C_4H_9$
1126.	OCH_3	H	OCH_3	$n\text{-}C_4H_9$
1127.	OCH_3	H	Cl	$n\text{-}C_4H_9$
1128.	OCH_3	H	F	$n\text{-}C_4H_9$
1129.	OCH_3	H	CH_3	$n\text{-}C_4H_9$
1130.	OCH_3	H	C_2H_5	$n\text{-}C_4H_9$
1131.	OCH_3	H	CF_3	$n\text{-}C_4H_9$
1132.	OCH_3	H	OCF_3	$n\text{-}C_4H_9$
1133.	OCH_3	H	$OCHF_2$	$n\text{-}C_4H_9$
1134.	OCH_3	H	Br	$C(CH_3)_3$
1135.	OCH_3	H	OCH_3	$C(CH_3)_3$
1136.	OCH_3	H	Cl	$C(CH_3)_3$
1137.	OCH_3	H	F	$C(CH_3)_3$
1138.	OCH_3	H	CH_3	$C(CH_3)_3$
1139.	OCH_3	H	C_2H_5	$C(CH_3)_3$
1140.	OCH_3	H	CF_3	$C(CH_3)_3$
1141.	OCH_3	H	OCF_3	$C(CH_3)_3$
1142.	OCH_3	H	$OCHF_2$	$C(CH_3)_3$
1143.	OCH_3	H	Br	C_6H_5
1144.	OCH_3	H	OCH_3	C_6H_5

No.	R^b	R^c	R^d	R^2
1145.	OCH_3	H	Cl	C_6H_5
1146.	OCH_3	H	F	C_6H_5
1147.	OCH_3	H	CH_3	C_6H_5
1148.	OCH_3	H	C_2H_5	C_6H_5
1149.	OCH_3	H	CF_3	C_6H_5
1150.	OCH_3	H	OCF_3	C_6H_5
1151.	OCH_3	H	$OCHF_2$	C_6H_5
1152.	OCH_3	H	Br	cyclopropyl
1153.	OCH_3	H	OCH_3	cyclopropyl
1154.	OCH_3	H	Cl	cyclopropyl
1155.	OCH_3	H	F	cyclopropyl
1156.	OCH_3	H	CH_3	cyclopropyl
1157.	OCH_3	H	C_2H_5	cyclopropyl
1158.	OCH_3	H	CF_3	cyclopropyl
1159.	OCH_3	H	OCF_3	cyclopropyl
1160.	OCH_3	H	$OCHF_2$	cyclopropyl
1161.	OCH_3	H	Br	CH_2-cyclopropyl
1162.	OCH_3	H	OCH_3	CH_2-cyclopropyl
1163.	OCH_3	H	Cl	CH_2-cyclopropyl
1164.	OCH_3	H	F	CH_2-cyclopropyl
1165.	OCH_3	H	CH_3	CH_2-cyclopropyl
1166.	OCH_3	H	C_2H_5	CH_2-cyclopropyl
1167.	OCH_3	H	CF_3	CH_2-cyclopropyl
1168.	OCH_3	H	OCF_3	CH_2-cyclopropyl
1169.	OCH_3	H	$OCHF_2$	CH_2-cyclopropyl
1170.	OCH_3	H	Br	cyclobutyl
1171.	OCH_3	H	OCH_3	cyclobutyl
1172.	OCH_3	H	Cl	cyclobutyl
1173.	OCH_3	H	F	cyclobutyl
1174.	OCH_3	H	CH_3	cyclobutyl
1175.	OCH_3	H	C_2H_5	cyclobutyl
1176.	OCH_3	H	CF_3	cyclobutyl
1177.	OCH_3	H	OCF_3	cyclobutyl
1178.	OCH_3	H	$OCHF_2$	cyclobutyl
1179.	OCH_3	H	Br	cyclopentyl
1180.	OCH_3	H	OCH_3	cyclopentyl
1181.	OCH_3	H	Cl	cyclopentyl
1182.	OCH_3	H	F	cyclopentyl
1183.	OCH_3	H	CH_3	cyclopentyl
1184.	OCH_3	H	C_2H_5	cyclopentyl
1185.	OCH_3	H	CF_3	cyclopentyl
1186.	OCH_3	H	OCF_3	cyclopentyl
1187.	OCH_3	H	$OCHF_2$	cyclopentyl
1188.	OCH_3	H	Br	cyclohexyl
1189.	OCH_3	H	OCH_3	cyclohexyl
1190.	OCH_3	H	Cl	cyclohexyl
1191.	OCH_3	H	F	cyclohexyl
1192.	OCH_3	H	CH_3	cyclohexyl
1193.	OCH_3	H	C_2H_5	cyclohexyl
1194.	OCH_3	H	CF_3	cyclohexyl

No.	R^b	R^c	R^d	R^2
1195.	OCH_3	H	OCF_3	cyclohexyl
1196.	OCH_3	H	$OCHF_2$	cyclohexyl
1197.	Cl	Cl	H	H
1198.	Cl	F	H	H
1199.	Cl	CH_3	H	H
1200.	Cl	OCH_3	H	H
1201.	Cl	Br	H	H
1202.	Cl	CF_3	H	H
1203.	Cl	OCF_3	H	H
1204.	Cl	Cl	H	CH_3
1205.	Cl	F	H	CH_3
1206.	Cl	CH_3	H	CH_3
1207.	Cl	OCH_3	H	CH_3
1208.	Cl	Br	H	CH_3
1209.	Cl	CF_3	H	CH_3
1210.	Cl	OCF_3	H	CH_3
1211.	Cl	Cl	H	C_2H_5
1212.	Cl	F	H	C_2H_5
1213.	Cl	CH_3	H	C_2H_5
1214.	Cl	OCH_3	H	C_2H_5
1215.	Cl	Br	H	C_2H_5
1216.	Cl	CF_3	H	C_2H_5
1217.	Cl	OCF_3	H	C_2H_5
1218.	Cl	Cl	H	n-C_3H_7
1219.	Cl	F	H	n-C_3H_7
1220.	Cl	CH_3	H	n-C_3H_7
1221.	Cl	OCH_3	H	n-C_3H_7
1222.	Cl	Br	H	n-C_3H_7
1223.	Cl	CF_3	H	n-C_3H_7
1224.	Cl	OCF_3	H	n-C_3H_7
1225.	Cl	Cl	H	$CH(CH_3)_2$
1226.	Cl	F	H	$CH(CH_3)_2$
1227.	Cl	CH_3	H	$CH(CH_3)_2$
1228.	Cl	OCH_3	H	$CH(CH_3)_2$
1229.	Cl	Br	H	$CH(CH_3)_2$
1230.	Cl	CF_3	H	$CH(CH_3)_2$
1231.	Cl	OCF_3	H	$CH(CH_3)_2$
1232.	Cl	Cl	H	n-C_4H_9
1233.	Cl	F	H	n-C_4H_9
1234.	Cl	CH_3	H	n-C_4H_9
1235.	Cl	OCH_3	H	n-C_4H_9
1236.	Cl	Br	H	n-C_4H_9
1237.	Cl	CF_3	H	n-C_4H_9
1238.	Cl	OCF_3	H	n-C_4H_9
1239.	Cl	Cl	H	$C(CH_3)_3$
1240.	Cl	F	H	$C(CH_3)_3$
1241.	Cl	CH_3	H	$C(CH_3)_3$
1242.	Cl	OCH_3	H	$C(CH_3)_3$
1243.	Cl	Br	H	$C(CH_3)_3$
1244.	Cl	CF_3	H	$C(CH_3)_3$
1245.	Cl	OCF_3	H	$C(CH_3)_3$

No.	R^b	R^c	R^d	R^2
1246.	Cl	Cl	H	C_6H_5
1247.	Cl	F	H	C_6H_5
1248.	Cl	CH_3	H	C_6H_5
1249.	Cl	OCH_3	H	C_6H_5
1250.	Cl	Br	H	C_6H_5
1251.	Cl	CF_3	H	C_6H_5
1252.	Cl	OCF_3	H	C_6H_5
1253.	Cl	Cl	H	cyclopropyl
1254.	Cl	F	H	cyclopropyl
1255.	Cl	CH_3	H	cyclopropyl
1256.	Cl	OCH_3	H	cyclopropyl
1257.	Cl	Br	H	cyclopropyl
1258.	Cl	CF_3	H	cyclopropyl
1259.	Cl	OCF_3	H	cyclopropyl
1260.	Cl	Cl	H	CH_2-cyclopropyl
1261.	Cl	F	H	CH_2-cyclopropyl
1262.	Cl	CH_3	H	CH_2-cyclopropyl
1263.	Cl	OCH_3	H	CH_2-cyclopropyl
1264.	Cl	Br	H	CH_2-cyclopropyl
1265.	Cl	CF_3	H	CH_2-cyclopropyl
1266.	Cl	OCF_3	H	CH_2-cyclopropyl
1267.	Cl	Cl	H	cyclobutyl
1268.	Cl	F	H	cyclobutyl
1269.	Cl	CH_3	H	cyclobutyl
1270.	Cl	OCH_3	H	cyclobutyl
1271.	Cl	Br	H	cyclobutyl
1272.	Cl	CF_3	H	cyclobutyl
1273.	Cl	OCF_3	H	cyclobutyl
1274.	Cl	Cl	H	cyclopentyl
1275.	Cl	F	H	cyclopentyl
1276.	Cl	CH_3	H	cyclopentyl
1277.	Cl	OCH_3	H	cyclopentyl
1278.	Cl	Br	H	cyclopentyl
1279.	Cl	CF_3	H	cyclopentyl
1280.	Cl	OCF_3	H	cyclopentyl
1281.	Cl	Cl	H	cyclohexyl
1282.	Cl	F	H	cyclohexyl
1283.	Cl	CH_3	H	cyclohexyl
1284.	Cl	OCH_3	H	cyclohexyl
1285.	Cl	Br	H	cyclohexyl
1286.	Cl	CF_3	H	cyclohexyl
1287.	Cl	OCF_3	H	cyclohexyl
1288.	Cl	H	Cl	H
1289.	Cl	H	F	H
1290.	Cl	H	CH_3	H
1291.	Cl	H	OCH_3	H
1292.	Cl	H	Br	H
1293.	Cl	H	CF_3	H
1294.	Cl	H	OCF_3	H
1295.	Cl	H	Cl	CH_3
1296.	Cl	H	F	CH_3

No.	R^b	R^c	R^d	R^2
1297.	Cl	H	CH_3	CH_3
1298.	Cl	H	OCH_3	CH_3
1299.	Cl	H	Br	CH_3
1300.	Cl	H	CF_3	CH_3
1301.	Cl	H	OCF_3	CH_3
1302.	Cl	H	Cl	C_2H_5
1303.	Cl	H	F	C_2H_5
1304.	Cl	H	CH_3	C_2H_5
1305.	Cl	H	OCH_3	C_2H_5
1306.	Cl	H	Br	C_2H_5
1307.	Cl	H	CF_3	C_2H_5
1308.	Cl	H	OCF_3	C_2H_5
1309.	Cl	H	Cl	n-C_3H_7
1310.	Cl	H	F	n-C_3H_7
1311.	Cl	H	CH_3	n-C_3H_7
1312.	Cl	H	OCH_3	n-C_3H_7
1313.	Cl	H	Br	n-C_3H_7
1314.	Cl	H	CF_3	n-C_3H_7
1315.	Cl	H	OCF_3	n-C_3H_7
1316.	Cl	H	Cl	$CH(CH_3)_2$
1317.	Cl	H	F	$CH(CH_3)_2$
1318.	Cl	H	CH_3	$CH(CH_3)_2$
1319.	Cl	H	OCH_3	$CH(CH_3)_2$
1320.	Cl	H	Br	$CH(CH_3)_2$
1321.	Cl	H	CF_3	$CH(CH_3)_2$
1322.	Cl	H	OCF_3	$CH(CH_3)_2$
1323.	Cl	H	Cl	n-C_4H_9
1324.	Cl	H	F	n-C_4H_9
1325.	Cl	H	CH_3	n-C_4H_9
1326.	Cl	H	OCH_3	n-C_4H_9
1327.	Cl	H	Br	n-C_4H_9
1328.	Cl	H	CF_3	n-C_4H_9
1329.	Cl	H	OCF_3	n-C_4H_9
1330.	Cl	H	Cl	$C(CH_3)_3$
1331.	Cl	H	F	$C(CH_3)_3$
1332.	Cl	H	CH_3	$C(CH_3)_3$
1333.	Cl	H	OCH_3	$C(CH_3)_3$
1334.	Cl	H	Br	$C(CH_3)_3$
1335.	Cl	H	CF_3	$C(CH_3)_3$
1336.	Cl	H	OCF_3	$C(CH_3)_3$
1337.	Cl	H	Cl	C_6H_5
1338.	Cl	H	F	C_6H_5
1339.	Cl	H	CH_3	C_6H_5
1340.	Cl	H	OCH_3	C_6H_5
1341.	Cl	H	Br	C_6H_5
1342.	Cl	H	CF_3	C_6H_5
1343.	Cl	H	OCF_3	C_6H_5
1344.	Cl	H	Cl	cyclopropyl
1345.	Cl	H	F	cyclopropyl
1346.	Cl	H	CH_3	cyclopropyl
1347.	Cl	H	OCH_3	cyclopropyl

No.	R^b	R^c	R^d	R^2
1348.	Cl	H	Br	cyclopropyl
1349.	Cl	H	CF_3	cyclopropyl
1350.	Cl	H	OCF_3	cyclopropyl
1351.	Cl	H	Cl	CH_2-cyclopropyl
1352.	Cl	H	F	CH_2-cyclopropyl
1353.	Cl	H	CH_3	CH_2-cyclopropyl
1354.	Cl	H	OCH_3	CH_2-cyclopropyl
1355.	Cl	H	Br	CH_2-cyclopropyl
1356.	Cl	H	CF_3	CH_2-cyclopropyl
1357.	Cl	H	OCF_3	CH_2-cyclopropyl
1358.	Cl	H	Cl	cyclobutyl
1359.	Cl	H	F	cyclobutyl
1360.	Cl	H	CH_3	cyclobutyl
1361.	Cl	H	OCH_3	cyclobutyl
1362.	Cl	H	Br	cyclobutyl
1363.	Cl	H	CF_3	cyclobutyl
1364.	Cl	H	OCF_3	cyclobutyl
1365.	Cl	H	Cl	cyclopentyl
1366.	Cl	H	F	cyclopentyl
1367.	Cl	H	CH_3	cyclopentyl
1368.	Cl	H	OCH_3	cyclopentyl
1369.	Cl	H	Br	cyclopentyl
1370.	Cl	H	CF_3	cyclopentyl
1371.	Cl	H	OCF_3	cyclopentyl
1372.	Cl	H	Cl	cyclohexyl
1373.	Cl	H	F	cyclohexyl
1374.	Cl	H	CH_3	cyclohexyl
1375.	Cl	H	OCH_3	cyclohexyl
1376.	Cl	H	Br	cyclohexyl
1377.	Cl	H	CF_3	cyclohexyl
1378.	Cl	H	OCF_3	cyclohexyl
1379.	Br	Cl	H	H
1380.	Br	F	H	H
1381.	Br	CH_3	H	H
1382.	Br	OCH_3	H	H
1383.	Br	Br	H	H
1384.	Br	CF_3	H	H
1385.	Br	OCF_3	H	H
1386.	Br	Cl	H	CH_3
1387.	Br	F	H	CH_3
1388.	Br	CH_3	H	CH_3
1389.	Br	OCH_3	H	CH_3
1390.	Br	Br	H	CH_3
1391.	Br	CF_3	H	CH_3
1392.	Br	OCF_3	H	CH_3
1393.	Br	Cl	H	C_2H_5
1394.	Br	F	H	C_2H_5
1395.	Br	CH_3	H	C_2H_5
1396.	Br	OCH_3	H	C_2H_5
1397.	Br	Br	H	C_2H_5
1398.	Br	CF_3	H	C_2H_5

No.	R^b	R^c	R^d	R^2
1399.	Br	OCF_3	H	C_2H_5
1400.	Br	Cl	H	n-C_3H_7
1401.	Br	F	H	n-C_3H_7
1402.	Br	CH_3	H	n-C_3H_7
1403.	Br	OCH_3	H	n-C_3H_7
1404.	Br	Br	H	n-C_3H_7
1405.	Br	CF_3	H	n-C_3H_7
1406.	Br	OCF_3	H	n-C_3H_7
1407.	Br	Cl	H	$CH(CH_3)_2$
1408.	Br	F	H	$CH(CH_3)_2$
1409.	Br	CH_3	H	$CH(CH_3)_2$
1410.	Br	OCH_3	H	$CH(CH_3)_2$
1411.	Br	Br	H	$CH(CH_3)_2$
1412.	Br	CF_3	H	$CH(CH_3)_2$
1413.	Br	OCF_3	H	$CH(CH_3)_2$
1414.	Br	Cl	H	n-C_4H_9
1415.	Br	F	H	n-C_4H_9
1416.	Br	CH_3	H	n-C_4H_9
1417.	Br	OCH_3	H	n-C_4H_9
1418.	Br	Br	H	n-C_4H_9
1419.	Br	CF_3	H	n-C_4H_9
1420.	Br	OCF_3	H	n-C_4H_9
1421.	Br	Cl	H	$C(CH_3)_3$
1422.	Br	F	H	$C(CH_3)_3$
1423.	Br	CH_3	H	$C(CH_3)_3$
1424.	Br	OCH_3	H	$C(CH_3)_3$
1425.	Br	Br	H	$C(CH_3)_3$
1426.	Br	CF_3	H	$C(CH_3)_3$
1427.	Br	OCF_3	H	$C(CH_3)_3$
1428.	Br	Cl	H	C_6H_5
1429.	Br	F	H	C_6H_5
1430.	Br	CH_3	H	C_6H_5
1431.	Br	OCH_3	H	C_6H_5
1432.	Br	Br	H	C_6H_5
1433.	Br	CF_3	H	C_6H_5
1434.	Br	OCF_3	H	C_6H_5
1435.	Br	Cl	H	cyclopropyl
1436.	Br	F	H	cyclopropyl
1437.	Br	CH_3	H	cyclopropyl
1438.	Br	OCH_3	H	cyclopropyl
1439.	Br	Br	H	cyclopropyl
1440.	Br	CF_3	H	cyclopropyl
1441.	Br	OCF_3	H	cyclopropyl
1442.	Br	Cl	H	CH_2-cyclopropyl
1443.	Br	F	H	CH_2-cyclopropyl
1444.	Br	CH_3	H	CH_2-cyclopropyl
1445.	Br	OCH_3	H	CH_2-cyclopropyl
1446.	Br	Br	H	CH_2-cyclopropyl
1447.	Br	CF_3	H	CH_2-cyclopropyl
1448.	Br	OCF_3	H	CH_2-cyclopropyl
1449.	Br	Cl	H	cyclobutyl

No.	R^b	R^c	R^d	R^2
1450.	Br	F	H	cyclobutyl
1451.	Br	CH_3	H	cyclobutyl
1452.	Br	OCH_3	H	cyclobutyl
1453.	Br	Br	H	cyclobutyl
1454.	Br	CF_3	H	cyclobutyl
1455.	Br	OCF_3	H	cyclobutyl
1456.	Br	Cl	H	cyclopentyl
1457.	Br	F	H	cyclopentyl
1458.	Br	CH_3	H	cyclopentyl
1459.	Br	OCH_3	H	cyclopentyl
1460.	Br	Br	H	cyclopentyl
1461.	Br	CF_3	H	cyclopentyl
1462.	Br	OCF_3	H	cyclopentyl
1463.	Br	Cl	H	cyclohexyl
1464.	Br	F	H	cyclohexyl
1465.	Br	CH_3	H	cyclohexyl
1466.	Br	OCH_3	H	cyclohexyl
1467.	Br	Br	H	cyclohexyl
1468.	Br	CF_3	H	cyclohexyl
1469.	Br	OCF_3	H	cyclohexyl
1470.	Br	H	Cl	H
1471.	Br	H	F	H
1472.	Br	H	CH_3	H
1473.	Br	H	OCH_3	H
1474.	Br	H	Br	H
1475.	Br	H	CF_3	H
1476.	Br	H	OCF_3	H
1477.	Br	H	Cl	CH_3
1478.	Br	H	F	CH_3
1479.	Br	H	CH_3	CH_3
1480.	Br	H	OCH_3	CH_3
1481.	Br	H	Br	CH_3
1482.	Br	H	CF_3	CH_3
1483.	Br	H	OCF_3	CH_3
1484.	Br	H	Cl	C_2H_5
1485.	Br	H	F	C_2H_5
1486.	Br	H	CH_3	C_2H_5
1487.	Br	H	OCH_3	C_2H_5
1488.	Br	H	Br	C_2H_5
1489.	Br	H	CF_3	C_2H_5
1490.	Br	H	OCF_3	C_2H_5
1491.	Br	H	Cl	n-C_3H_7
1492.	Br	H	F	n-C_3H_7
1493.	Br	H	CH_3	n-C_3H_7
1494.	Br	H	OCH_3	n-C_3H_7
1495.	Br	H	Br	n-C_3H_7
1496.	Br	H	CF_3	n-C_3H_7
1497.	Br	H	OCF_3	n-C_3H_7
1498.	Br	H	Cl	$CH(CH_3)_2$
1499.	Br	H	F	$CH(CH_3)_2$
1500.	Br	H	CH_3	$CH(CH_3)_2$

No.	R^b	R^c	R^d	R^2
1501.	Br	H	OCH_3	$CH(CH_3)_2$
1502.	Br	H	Br	$CH(CH_3)_2$
1503.	Br	H	CF_3	$CH(CH_3)_2$
1504.	Br	H	OCF_3	$CH(CH_3)_2$
1505.	Br	H	Cl	$n-C_4H_9$
1506.	Br	H	F	$n-C_4H_9$
1507.	Br	H	CH_3	$n-C_4H_9$
1508.	Br	H	OCH_3	$n-C_4H_9$
1509.	Br	H	Br	$n-C_4H_9$
1510.	Br	H	CF_3	$n-C_4H_9$
1511.	Br	H	OCF_3	$n-C_4H_9$
1512.	Br	H	Cl	$C(CH_3)_3$
1513.	Br	H	F	$C(CH_3)_3$
1514.	Br	H	CH_3	$C(CH_3)_3$
1515.	Br	H	OCH_3	$C(CH_3)_3$
1516.	Br	H	Br	$C(CH_3)_3$
1517.	Br	H	CF_3	$C(CH_3)_3$
1518.	Br	H	OCF_3	$C(CH_3)_3$
1519.	Br	H	Cl	C_6H_5
1520.	Br	H	F	C_6H_5
1521.	Br	H	CH_3	C_6H_5
1522.	Br	H	OCH_3	C_6H_5
1523.	Br	H	Br	C_6H_5
1524.	Br	H	CF_3	C_6H_5
1525.	Br	H	OCF_3	C_6H_5
1526.	Br	H	Cl	cyclopropyl
1527.	Br	H	F	cyclopropyl
1528.	Br	H	CH_3	cyclopropyl
1529.	Br	H	OCH_3	cyclopropyl
1530.	Br	H	Br	cyclopropyl
1531.	Br	H	CF_3	cyclopropyl
1532.	Br	H	OCF_3	cyclopropyl
1533.	Br	H	Cl	CH_2-cyclopropyl
1534.	Br	H	F	CH_2-cyclopropyl
1535.	Br	H	CH_3	CH_2-cyclopropyl
1536.	Br	H	OCH_3	CH_2-cyclopropyl
1537.	Br	H	Br	CH_2-cyclopropyl
1538.	Br	H	CF_3	CH_2-cyclopropyl
1539.	Br	H	OCF_3	CH_2-cyclopropyl
1540.	Br	H	Cl	cyclobutyl
1541.	Br	H	F	cyclobutyl
1542.	Br	H	CH_3	cyclobutyl
1543.	Br	H	OCH_3	cyclobutyl
1544.	Br	H	Br	cyclobutyl
1545.	Br	H	CF_3	cyclobutyl
1546.	Br	H	OCF_3	cyclobutyl
1547.	Br	H	Cl	cyclopentyl
1548.	Br	H	F	cyclopentyl
1549.	Br	H	CH_3	cyclopentyl
1550.	Br	H	OCH_3	cyclopentyl
1551.	Br	H	Br	cyclopentyl

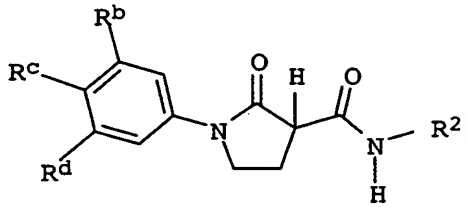
No.	R^b	R^c	R^d	R^2
1552.	Br	H	CF_3	cyclopentyl
1553.	Br	H	OCF_3	cyclopentyl
1554.	Br	H	Cl	cyclohexyl
1555.	Br	H	F	cyclohexyl
1556.	Br	H	CH_3	cyclohexyl
1557.	Br	H	OCH_3	cyclohexyl
1558.	Br	H	Br	cyclohexyl
1559.	Br	H	CF_3	cyclohexyl
1560.	Br	H	OCF_3	cyclohexyl
1561.	CH_3	Cl	H	H
1562.	CH_3	F	H	H
1563.	CH_3	CH_3	H	H
1564.	CH_3	OCH_3	H	H
1565.	CH_3	Br	H	H
1566.	CH_3	CF_3	H	H
1567.	CH_3	OCF_3	H	H
1568.	CH_3	Cl	H	CH_3
1569.	CH_3	F	H	CH_3
1570.	CH_3	CH_3	H	CH_3
1571.	CH_3	Br	H	CH_3
1572.	CH_3	CF_3	H	CH_3
1573.	CH_3	OCF_3	H	CH_3
1574.	CH_3	Cl	H	C_2H_5
1575.	CH_3	F	H	C_2H_5
1576.	CH_3	CH_3	H	C_2H_5
1577.	CH_3	Br	H	C_2H_5
1578.	CH_3	CF_3	H	C_2H_5
1579.	CH_3	OCF_3	H	C_2H_5
1580.	CH_3	Cl	H	n-C_3H_7
1581.	CH_3	F	H	n-C_3H_7
1582.	CH_3	CH_3	H	n-C_3H_7
1583.	CH_3	Br	H	n-C_3H_7
1584.	CH_3	CF_3	H	n-C_3H_7
1585.	CH_3	OCF_3	H	n-C_3H_7
1586.	CH_3	Cl	H	$CH(CH_3)_2$
1587.	CH_3	F	H	$CH(CH_3)_2$
1588.	CH_3	CH_3	H	$CH(CH_3)_2$
1589.	CH_3	Br	H	$CH(CH_3)_2$
1590.	CH_3	CF_3	H	$CH(CH_3)_2$
1591.	CH_3	OCF_3	H	$CH(CH_3)_2$
1592.	CH_3	Cl	H	n-C_4H_9
1593.	CH_3	F	H	n-C_4H_9
1594.	CH_3	CH_3	H	n-C_4H_9
1595.	CH_3	Br	H	n-C_4H_9
1596.	CH_3	CF_3	H	n-C_4H_9
1597.	CH_3	OCF_3	H	n-C_4H_9
1598.	CH_3	Cl	H	$C(CH_3)_3$
1599.	CH_3	F	H	$C(CH_3)_3$
1600.	CH_3	CH_3	H	$C(CH_3)_3$
1601.	CH_3	Br	H	$C(CH_3)_3$
1602.	CH_3	CF_3	H	$C(CH_3)_3$

No.	R^b	R^c	R^d	R^2
1603.	CH_3	OCF_3	H	$C(CH_3)_3$
1604.	CH_3	Cl	H	C_6H_5
1605.	CH_3	F	H	C_6H_5
1606.	CH_3	CH_3	H	C_6H_5
1607.	CH_3	Br	H	C_6H_5
1608.	CH_3	CF_3	H	C_6H_5
1609.	CH_3	OCF_3	H	C_6H_5
1610.	CH_3	Cl	H	cyclopropyl
1611.	CH_3	F	H	cyclopropyl
1612.	CH_3	CH_3	H	cyclopropyl
1613.	CH_3	Br	H	cyclopropyl
1614.	CH_3	CF_3	H	cyclopropyl
1615.	CH_3	OCF_3	H	cyclopropyl
1616.	CH_3	Cl	H	CH_2-cyclopropyl
1617.	CH_3	F	H	CH_2-cyclopropyl
1618.	CH_3	CH_3	H	CH_2-cyclopropyl
1619.	CH_3	Br	H	CH_2-cyclopropyl
1620.	CH_3	CF_3	H	CH_2-cyclopropyl
1621.	CH_3	OCF_3	H	CH_2-cyclopropyl
1622.	CH_3	Cl	H	cyclobutyl
1623.	CH_3	F	H	cyclobutyl
1624.	CH_3	CH_3	H	cyclobutyl
1625.	CH_3	Br	H	cyclobutyl
1626.	CH_3	CF_3	H	cyclobutyl
1627.	CH_3	OCF_3	H	cyclobutyl
1628.	CH_3	Cl	H	cyclopentyl
1629.	CH_3	F	H	cyclopentyl
1630.	CH_3	CH_3	H	cyclopentyl
1631.	CH_3	Br	H	cyclopentyl
1632.	CH_3	CF_3	H	cyclopentyl
1633.	CH_3	OCF_3	H	cyclopentyl
1634.	CH_3	Cl	H	cyclohexyl
1635.	CH_3	F	H	cyclohexyl
1636.	CH_3	CH_3	H	cyclohexyl
1637.	CH_3	Br	H	cyclohexyl
1638.	CH_3	CF_3	H	cyclohexyl
1639.	CH_3	OCF_3	H	cyclohexyl
1640.	CH_3	H	Cl	H
1641.	CH_3	H	F	H
1642.	CH_3	H	CH_3	H
1643.	CH_3	H	Br	H
1644.	CH_3	H	CF_3	H
1645.	CH_3	H	OCF_3	H
1646.	CH_3	H	Cl	CH_3
1647.	CH_3	H	F	CH_3
1648.	CH_3	H	CH_3	CH_3
1649.	CH_3	H	Br	CH_3
1650.	CH_3	H	CF_3	CH_3
1651.	CH_3	H	OCF_3	CH_3
1652.	CH_3	H	Cl	C_2H_5
1653.	CH_3	H	F	C_2H_5

No.	R^b	R^c	R^d	R^2
1654.	CH_3	H	CH_3	C_2H_5
1655.	CH_3	H	Br	C_2H_5
1656.	CH_3	H	CF_3	C_2H_5
1657.	CH_3	H	OCF_3	C_2H_5
1658.	CH_3	H	Cl	n-C_3H_7
1659.	CH_3	H	F	n-C_3H_7
1660.	CH_3	H	CH_3	n-C_3H_7
1661.	CH_3	H	Br	n-C_3H_7
1662.	CH_3	H	CF_3	n-C_3H_7
1663.	CH_3	H	OCF_3	n-C_3H_7
1664.	CH_3	H	Cl	$CH(CH_3)_2$
1665.	CH_3	H	F	$CH(CH_3)_2$
1666.	CH_3	H	CH_3	$CH(CH_3)_2$
1667.	CH_3	H	Br	$CH(CH_3)_2$
1668.	CH_3	H	CF_3	$CH(CH_3)_2$
1669.	CH_3	H	OCF_3	$CH(CH_3)_2$
1670.	CH_3	H	Cl	n-C_4H_9
1671.	CH_3	H	F	n-C_4H_9
1672.	CH_3	H	CH_3	n-C_4H_9
1673.	CH_3	H	Br	n-C_4H_9
1674.	CH_3	H	CF_3	n-C_4H_9
1675.	CH_3	H	OCF_3	n-C_4H_9
1676.	CH_3	H	Cl	$C(CH_3)_3$
1677.	CH_3	H	F	$C(CH_3)_3$
1678.	CH_3	H	CH_3	$C(CH_3)_3$
1679.	CH_3	H	Br	$C(CH_3)_3$
1680.	CH_3	H	CF_3	$C(CH_3)_3$
1681.	CH_3	H	OCF_3	$C(CH_3)_3$
1682.	CH_3	H	Cl	C_6H_5
1683.	CH_3	H	F	C_6H_5
1684.	CH_3	H	CH_3	C_6H_5
1685.	CH_3	H	Br	C_6H_5
1686.	CH_3	H	CF_3	C_6H_5
1687.	CH_3	H	OCF_3	C_6H_5
1688.	CH_3	H	Cl	cyclopropyl
1689.	CH_3	H	F	cyclopropyl
1690.	CH_3	H	CH_3	cyclopropyl
1691.	CH_3	H	Br	cyclopropyl
1692.	CH_3	H	CF_3	cyclopropyl
1693.	CH_3	H	OCF_3	cyclopropyl
1694.	CH_3	H	Cl	CH_2-cyclopropyl
1695.	CH_3	H	F	CH_2-cyclopropyl
1696.	CH_3	H	CH_3	CH_2-cyclopropyl
1697.	CH_3	H	Br	CH_2-cyclopropyl
1698.	CH_3	H	CF_3	CH_2-cyclopropyl
1699.	CH_3	H	OCF_3	CH_2-cyclopropyl
1700.	CH_3	H	Cl	cyclobutyl
1701.	CH_3	H	F	cyclobutyl
1702.	CH_3	H	CH_3	cyclobutyl
1703.	CH_3	H	Br	cyclobutyl
1704.	CH_3	H	CF_3	cyclobutyl

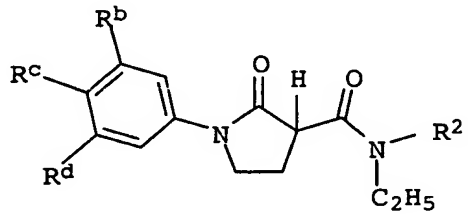
No.	R^b	R^c	R^d	R^2
1705.	CH_3	H	OCF_3	cyclobutyl
1706.	CH_3	H	Cl	cyclopentyl
1707.	CH_3	H	F	cyclopentyl
1708.	CH_3	H	CH_3	cyclopentyl
1709.	CH_3	H	Br	cyclopentyl
1710.	CH_3	H	CF_3	cyclopentyl
1711.	CH_3	H	OCF_3	cyclopentyl
1712.	CH_3	H	Cl	cyclohexyl
1713.	CH_3	H	F	cyclohexyl
1714.	CH_3	H	CH_3	cyclohexyl
1715.	CH_3	H	Br	cyclohexyl
1716.	CH_3	H	CF_3	cyclohexyl
1717.	CH_3	H	OCF_3	cyclohexyl

Particular preference is also given to the 1-phenylpyrrolidin-2-one-3-carboxamides of the formula Ib (≡ I where R^a = R^e = H, X = O, Y = O, R^1 = H, R^3 = H and n = 0) where R^b, R^c, R^d and R^2 have the meanings given above, in particular the meanings mentioned as being preferred. Examples of such compounds are the compounds Ib.1 to Ib.1717 in which the variables R^b, R^c, R^d and R^2 together have the meanings given in one row of Table 1.



(Ib)

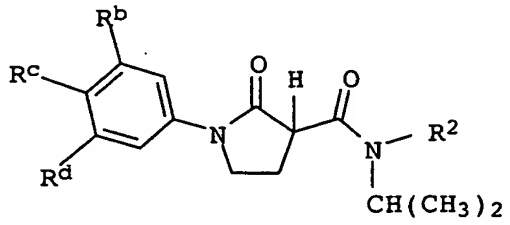
Particular preference is also given to the 1-phenylpyrrolidin-2-one-3-carboxamides of the formula Ic (≡ I where R^a = R^e = H, X = O, Y = O, R^1 = H, R^3 = C_2H_5 and n = 0) where R^b, R^c, R^d and R^2 have the meanings given above, in particular the meanings mentioned as being preferred. Examples of such compounds are the compounds Ic.1 to Ic.1717 in which the variables R^b, R^c, R^d and R^2 together have the meanings given in one row of Table 1.



(Ic)

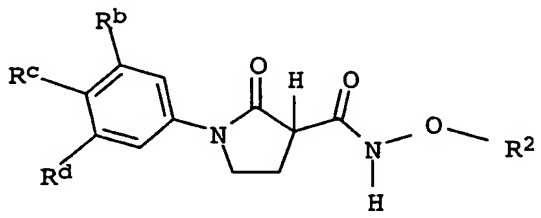
Particular preference is also given to the 1-phenylpyrrolidin-2-one-3-carboxamides of the formula Id (≡ I where X = O, Y = O, R^1 = H, R^3 = $CH(CH_3)_2$ and n = 0) where R^b, R^c, R^d and R^2 have the meanings given above, in particular the meanings mentioned as being preferred. Examples of such compounds are the compounds

Id.1 to Id.1717 in which the variables R^b, R^c, R^d and R^2 together have the meanings given in one row of Table 1.



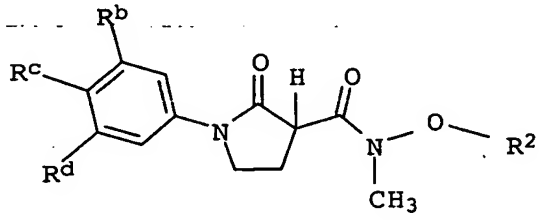
(Id)

Particular preference is also given to the 1-phenylpyrrolidin-2-one-3-carboxamides of the formula Ie (≡ I where X = O, Y = O, R^1 = H, R^3 = H, A = O and n = 1) where R^b, R^c, R^d and R^2 have the meanings given above, in particular the meanings mentioned as being preferred. Examples of such compounds are the compounds Ie.1 to Ie.1717 in which the variables R^b, R^c, R^d and R^2 together have the meanings given in one row of Table 1.



(Ie)

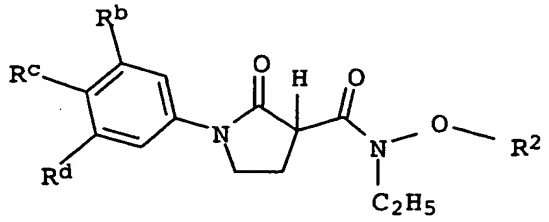
Particular preference is also given to the 1-phenylpyrrolidin-2-one-3-carboxamides of the formula If (≡ I where X = O, Y = O, R^1 = H, R^3 = CH_3, A = O and n = 1) where R^b, R^c, R^d and R^2 have the meanings given above, in particular the meanings mentioned as being preferred. Examples of such compounds are the compounds If.1 to If.1717 in which the variables R^b, R^c, R^d and R^2 together have the meanings given in one row of Table 1.



(If)

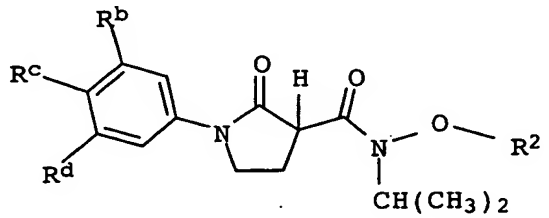
Particular preference is also given to the 1-phenylpyrrolidin-2-one-3-carboxamides of the formula Ig (≡ I where X = O, Y = O, R^1 = H, R^3 = C_2H_5, A = O and n = 1) where R^b, R^c, R^d and R^2 have the meanings given above, in particular the

meanings mentioned as being preferred. Examples of such compounds are the compounds Ig.1 to Ig.1717 in which the variables R^b, R^c, R^d and R^2 together have the meanings given in one row of Table 1.



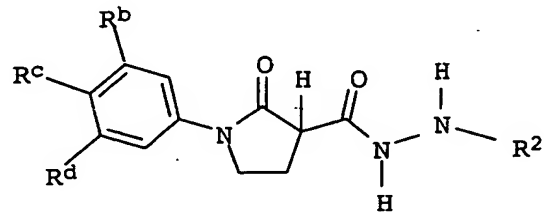
(Ig)

Particular preference is also given to the 1-phenylpyrrolidin-2-one-3-carboxamides of the formula Ih (≡ I where X = O, Y = O, R^1 = H, R^3 = $CH(CH_3)_2$, A = O and n = 1) where R^b, R^c, R^d and R^2 have the meanings given above, in particular the meanings mentioned as being preferred. Examples of such compounds are the compounds Ih.1 to Ih.1717 in which the variables R^b, R^c, R^d and R^2 together have the meanings given in one row of Table 1.



(Ih)

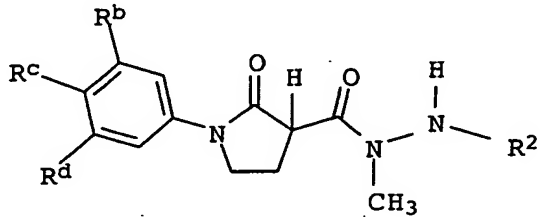
Particular preference is also given to the 1-phenylpyrrolidin-2-one-3-carboxamides of the formula Ii (≡ I where X = O, Y = O, R^1 = H, R^3 = H, n = 1 and A = NR^{12} where R^{12} = H) where R^b, R^c, R^d and R^2 have the meanings given above, in particular the meanings mentioned as being preferred. Examples of such compounds are the compounds Ii.1 to Ii.1717 in which the variables R^b, R^c, R^d and R^2 together have the meanings given in one row of Table 1.



(Ii)

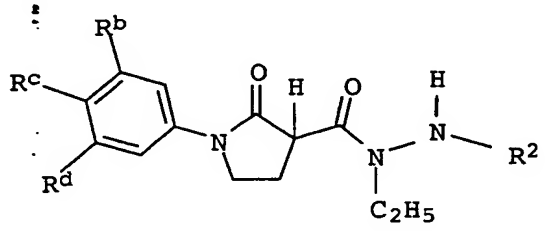
Particular preference is also given to the 1-phenylpyrrolidin-2-one-3-carboxamides of the formula Ij (≡ I where X = O, Y = O, R^1 = H, R^3 = CH_3, n = 1 and A = NR^{12} where R^{12} = H) where R^b, R^c,

R^d and R^2 have the meanings given above, in particular the meanings mentioned as being preferred. Examples of such compounds are the compounds Ij.1 to Ij.1717 in which the variables R^b, R^c, R^d and R^2 together have the meanings given in one row of Table 1.



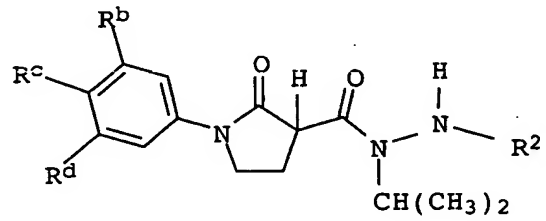
(Ij)

Particular preference is also given to the 1-phenylpyrrolidin-2-one-3-carboxamides of the formula Ik (≡ I where X = O, Y = O, R^1 = H, R^3 = C_2H_5, n = 1 and A = NR^{12} where R^{12} = H) where R^b, R^c, R^d and R^2 have the meanings given above, in particular the meanings mentioned as being preferred. Examples of such compounds are the compounds Ik.1 to Ik.1717 in which the variables R^b, R^c, R^d and R^2 together have the meanings given in one row of Table 1.



(Ik)

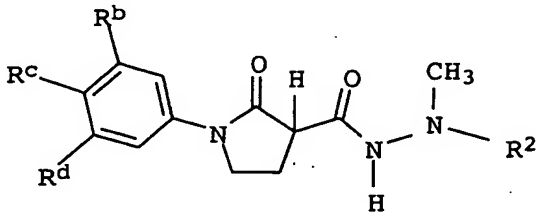
Particular preference is also given to the 1-phenylpyrrolidin-2-one-3-carboxamides of the formula Il (≡ I where X = O, Y = O, R^1 = H, R^3 = $CH(CH_3)_2$, n = 1 and A = NR^{12} where R^{12} = H) where R^b, R^c, R^d and R^2 have the meanings given above, in particular the meanings mentioned as being preferred. Examples of such compounds are the compounds Il.1 to Il.1717 in which the variables R^b, R^c, R^d and R^2 together have the meanings given in one row of Table 1.



(Il)

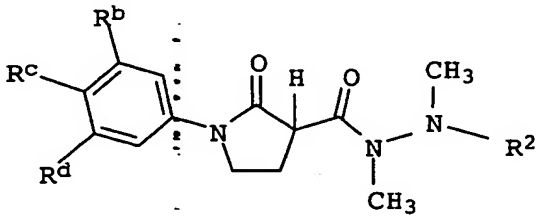
Particular preference is also given to the 1-phenylpyrrolidin-2-one-3-carboxamides of the formula Im (≡ I where X = O, Y = O, R^1 = H, R^3 = H, n = 1 and A = NR^{12} where R^{12} = CH_3) where R^b, R^c, R^d and R^2 have the meanings given above, in particular the

meanings mentioned as being preferred. Examples of such compounds are the compounds Im.1 to Im.1717 in which the variables R^b, R^c, R^d and R^2 together have the meanings given in one row of Table 1.



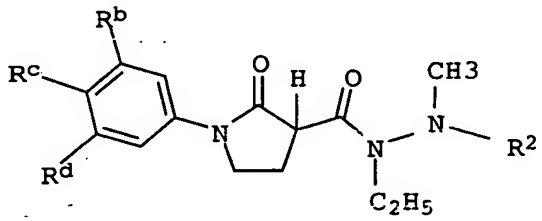
(Im)

Particular preference is also given to the 1-phenylpyrrolidin-2-one-3-carboxamides of the formula In (≡ I where X = O, Y = O, R^1 = H, R^3 = CH_3, n = 1 and A = NR^{12} where R^{12} = CH_3) where R^b, R^c, R^d and R^2 have the meanings given above, in particular the meanings mentioned as being preferred. Examples of such compounds are the compounds In.1 to In.1717 in which the variables R^b, R^c, R^d and R^2 together have the meanings given in one row of Table 1.



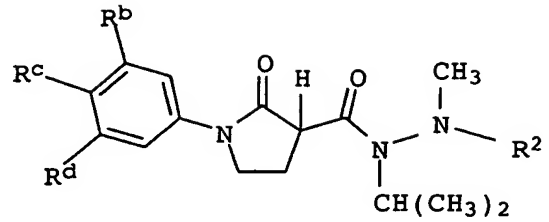
(In)

Particular preference is also given to the 1-phenylpyrrolidin-2-one-3-carboxamides of the formula Io (≡ I where X = O, Y = O, R^1 = H, R^3 = C_2H_5, n = 1 and A = NR^{12} where R^{12} = CH_3) where R^b, R^c, R^d and R^2 have the meanings given above, in particular the meanings mentioned as being preferred. Examples of such compounds are the compounds Io.1 to Io.1717 in which the variables R^b, R^c, R^d and R^2 together have the meanings given in one row of Table 1.



(Io)

Particular preference is also given to the 1-phenylpyrrolidin-2-one-3-carboxamides of the formula Ip (≡ I where X = O, Y = O, R^1 = H, R^3 = $CH(CH_3)_2$, n = 1 and A = NR^{12} where R^{12} = CH_3) where R^b, R^c, R^d and R^2 have the meanings given above, in particular the meanings mentioned as being preferred. Examples of such compounds are the compounds Ip.1 to Ip.1717 in which the variables R^b, R^c, R^d and R^2 together have the meanings given in one row of Table 1.



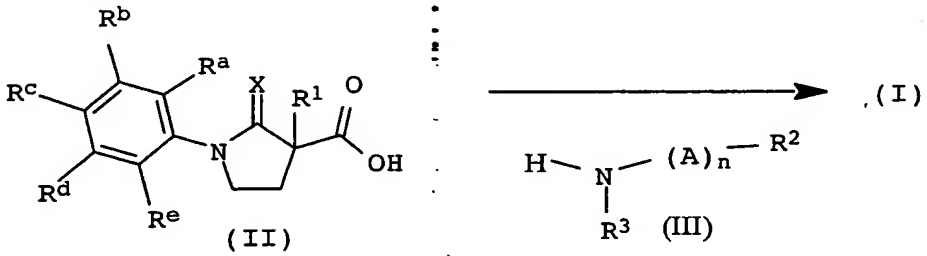
(Ip)

The 1-phenylpyrrolidin-2-one-3-carboxamides of the formula I according to the invention can be prepared, for example, by one of the processes A to G described below.

A) Amidation of a carboxylic acid II or a carboxylic acid derivative of II

The preparation of the compound I according to the invention can be carried out, for example, according to Scheme 1 by reacting an activated form of a pyrrolidine-3-carboxylic acid of the formula II with an amine III.

Scheme 1:



(II) (III) (I)

In Scheme 1, the variables R^1, X, R^a, R^b, R^c, R^d, R^e, A, n, R^2 and R^3 are as defined above. Such reactions are known, for example from WO 01/83459, and can be applied in an analogous manner to the reaction illustrated in Scheme 1. The carboxylic acid II is preferably initially activated by carrying out the reaction in the presence of a coupling agent. Suitable coupling agents are, for example, N,N'-carbonyldiimidazole or carbodiimides, such as dicyclohexylcarbodiimide. These compounds are generally employed in an at least equimolar amount and up to a four-fold excess, based on the carboxylic acid II. If appropriate, it may be advantageous to carry out the reaction of the carboxylic acid II with the coupling agent in the presence of a catalytic amount of a tertiary aminopyridine, such as 4-dimethylaminopyridine (DMAP). In this case, the amount of aminopyridine added is preferably 5 to 10 mol%, based on the carboxylic acid II. The reaction is usually carried out in a solvent. Suitable solvents are, for example, chlorinated hydrocarbons, such as methylene chloride,

1,2—dichloroethane, ethers, for example dialkyl ethers, such as diethyl ether, methyl tert—butyl ether, or cyclic ethers, such as tetrahydrofuran or dioxane, carboxamides, such as dimethylformamide, N-methyllactams, such as N-methylpyrrolidone, nitriles, such as acetonitrile, aromatic hydrocarbons, such as toluene, or mixtures of these.

The molar ratio of amine III to carboxylic acid II is generally at least 0.9:1, preferably at least 1:1. If appropriate, it may be advantageous to employ the amine in a slight excess, for example in an excess of up to 30%, based on the carboxylic acid II.

In general, the reaction temperature is in the range from 0°C to the boiling point of the solvent.

Alternatively, the carboxylic acid II can initially be activated by converting it into its acid halide, preferably its acid chloride. Means for this purpose are known, for example from US 4,874,422. Suitable compounds are inorganic acid halides, preferably acid chlorides, such as thionyl chloride, phosphoryl chloride, phosphorus pentachloride or phosphorus trichloride, and organic acid chlorides, such as oxalyl chloride. The acid halide of II formed can be isolated and then be reacted with the amine III. It is also possible to react the acid chloride of II formed directly, without isolation, with the amine III. If appropriate, the reactivity of the acid halide is enhanced by adding catalytic amounts of an N,N-dialkylcarboxamide, such as dimethylformamide. The halogenating agent is usually employed in an at least equimolar amount, based on the carboxylic acid II. The acid halides thionyl chloride, phosphorus trichloride or phosphoryl chloride can simultaneously act as solvent. Suitable solvents are furthermore solvents which are inert under the reaction conditions, for example chlorinated hydrocarbons, such as methylene chloride, 1,2—dichloroethane, aromatic hydrocarbons, such as benzene or toluene, aliphatic and cycloaliphatic hydrocarbons, such as hexane, petroleum ether, cyclohexane, and mixtures thereof. The reaction temperature is generally between room temperature and the boiling point of the solvent. After the reaction has ended, excess halogenating agent is generally removed. The resulting acid halide of II is then reacted with the amine III. In general, the amine III is dissolved in the solvent which was also used for preparing the carbonyl halide, unless the solvent is one of the acid halides mentioned above.

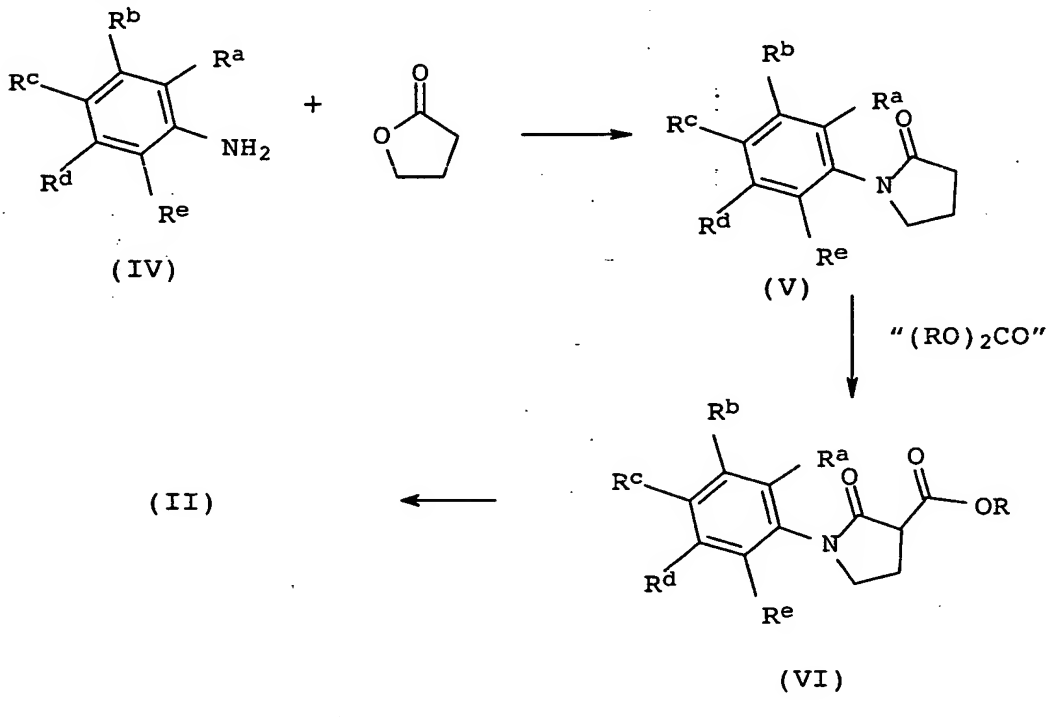
If appropriate, the reaction is carried out in the presence of an auxiliary base which is preferably employed in an equimolar amount or an up to four-fold excess, based on the carboxylic acid II. Suitable bases are, for example, amines such as 1,5-diazabicyclo[4.3.0]non-5-ene (DBN), 1,8-diazabicyclo[5.4.0]undec-7-ene (DBU), pyridine, α-, β-, γ-lutidine or triethylamine.

It is, of course, also possible to use other methods for activating the carboxylic acid II. Such methods are described in the prior art, for example in J. Falbe, Houben Weyl, Methoden der Organischen Chemie [Methods of organic chemistry], Vol. E5, 4th Ed., 1985, p. 941 ff.

In a further process variant, the corresponding carboxylic acid ester of II (carboxylic acid ester VI), in particular the C_1-C_4-alkyl ester of II and especially the methyl or ethyl ester of II, is reacted with the amine III, if appropriate in the presence of a base. Regarding a suitable base, solvent and reaction temperatures, reference is made to what was said above. The preparation of the carboxylic acid ester VI is described below.

Compounds of the formula II where R^1 = H can be prepared, for example, similarly to a process described in Journal of Heterocyclic Chemistry, 3 (1966), 311. The synthesis is shown in Scheme 2.

Scheme 2:



In Scheme 2, the variables R^a, R^b, R^c, R^d, R^e are as defined above and R is C_1-C_4-alkyl. The reaction of the aniline compound IV with butyrolactone is usually carried out in the presence of an inorganic acid, such as sulfuric acid, phosphoric acid or hydrochloric acid, or in the presence of an organic acid, such as acetic acid. The reaction can be carried out in the absence of a solvent or in the presence of a solvent. Suitable solvents are all solvents which are inert under the reaction conditions. However, the reaction is preferably carried out in the absence of a solvent. If the reaction is carried out in the absence of a solvent, the butyrolactone is employed in an excess, based on the aniline IV. The reaction temperatures are generally in the range of from 20°C to the boiling point of the solvent.

In the next step, the resulting pyrrolidinone V is generally reacted without further purification, for example with a carbonate $(RO)_2CO$ or a synthetic equivalent, such as a chloroformic ester. To this end, the pyrrolidinone V is generally initially converted into the corresponding enolate by treatment with a suitable base. Suitable bases include in particular organolithium compounds, such as n-butyllithium, tert-butyllithium and phenyllithium, lithium amides, such as lithium diisopropylamide, and alkali metal hydrides, such as sodium hydride. The reaction is generally carried out in an organic solvent. Suitable solvents are inert solvents, such as aliphatic and cycloaliphatic hydrocarbons, such as hexane, petroleum ether, cyclohexane, ethers, for example dialkyl ethers, such as diethyl ether, methyl tert-butyl ether, or cyclic ethers, such as tetrahydrofuran or dioxane, and also mixtures of these. In general, the deprotonation of the compound V is carried out at low temperatures to about room temperature, preferably at about 0°C. To this end, the base is employed in an at least equimolar amount, preferably a 1.1- to 4-fold molar excess, based on the compound V.

The subsequent introduction of the alkoxycarbonyl group is carried out, for example, using a carbonic acid diester, such as dimethyl carbonate or diethyl carbonate. The carbonic acid diester and the enolate of the compound V are usually employed in equimolar amounts. It is, of course, possible for one of the two reactants to be employed in a slight excess. The temperature required for the reaction is generally in the range of from 0°C to the boiling point of the solvent.

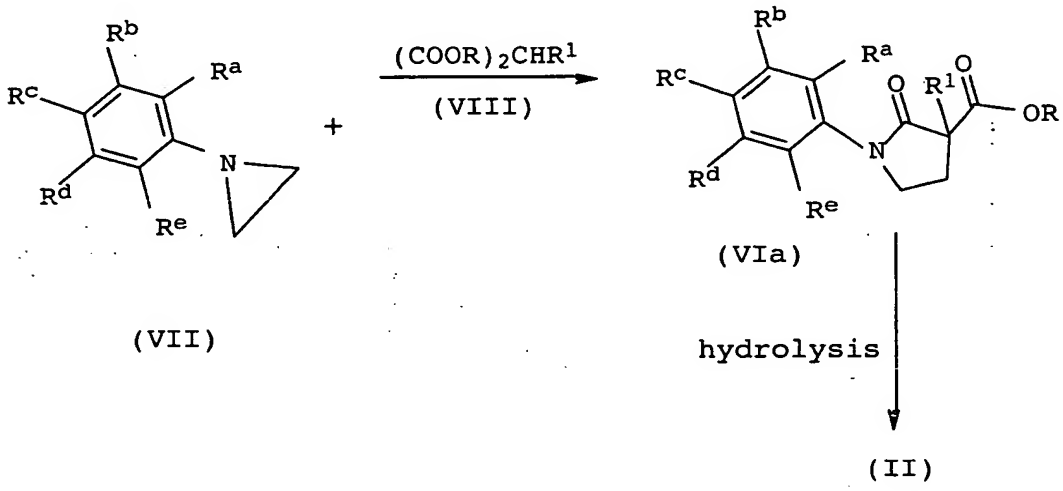
The carboxylic acid ester VI is then hydrolyzed by known methods (see, for example, Organikum, 17th Edition, VEB

Deutscher Verlag der Wissenschaften, 1988, p. 415) to give the carboxylic acid II. The hydrolysis can be carried out either in acidic medium using strong mineral acids, such as concentrated hydrochloric acid or sulfuric acid, or organic acids, such as glacial acetic acid, or mixtures of these in the presence of water, or in alkaline medium using bases, such as alkali metal hydroxide, for example sodium hydroxide or potassium hydroxide, if appropriate in the presence of water.

Suitable solvents both for acidic and basic hydrolysis of esters are, for example, ethers, for example dialkyl ethers, such as diethyl ether, methyl tert-butyl ether, or cyclic ethers, such as tetrahydrofuran or dioxane, alcohols, water and mixtures of these solvents. The reaction temperature is usually between room temperature and the boiling point of the solvent.

The compounds II can furthermore be prepared by aminoethylation of malonic acid esters VII in which R^1 is as defined above and R is C_1-C_4-alkyl with phenylaziridines VII and subsequent hydrolysis. The synthesis is shown in Scheme 3 and can be carried out similarly to known methods as described, for example, in Archiv der Pharmazie (Weinheim) 302(4) (1969), 253, Justus Liebigs Ann. Chem. 716 (1968), 121 - 126 or in Angew. Chem. 74, (1962), 694.

Scheme 3:

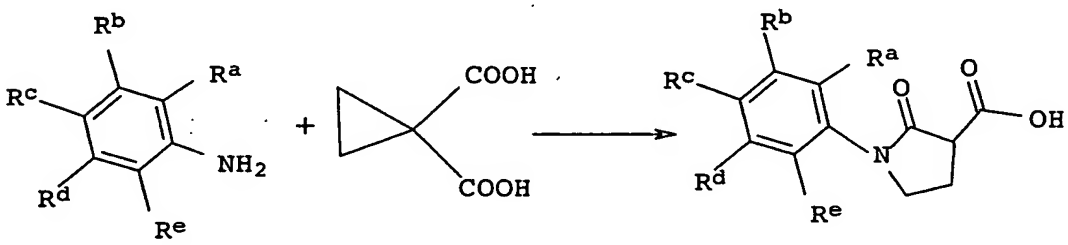


The reaction is generally carried out in the presence of LiH/LiI in a solvent. Suitable solvents include aromatic solvents, such as benzene, toluene or xylene. Frequently, the aziridine VII and the malonic acid ester are employed in approximately equimolar amounts. It may be advantageous to

employ an excess of malonic acid ester VIII, preferably an excess of up to 30%, based on the aziridine VII. The resulting ester VIa is then converted according to known methods by hydrolysis in acidic or alkaline medium into the corresponding carboxylic acids II. With regard to ester hydrolysis, reference is made to what was said above.

Compounds of the formula II in which R^1 is H can furthermore be prepared similarly to a process described in JP 2000143624-A. To this end, anilines IV are reacted with 1,1-cyclopropanedicarboxylic acid. The synthesis route is shown in Scheme 4. The reaction is usually carried out in water or in an aliphatic nitrile, such as acetonitrile, or in mixtures thereof with water, at temperatures between 40 and 100°C.

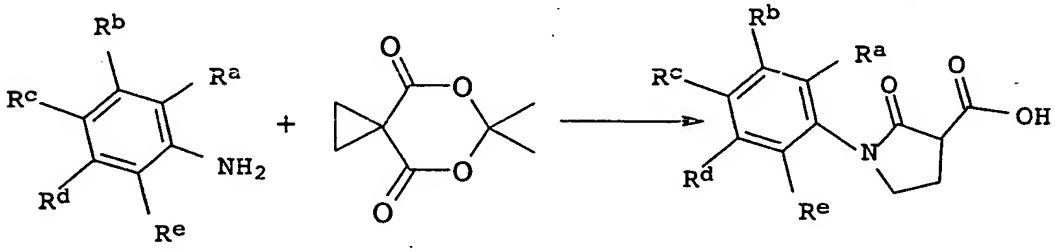
Scheme 4:



(IV) (II)

Compounds of the formula II in which R^1 is H can furthermore be obtained similarly to processes described in J. Am. Chem. Soc. 97 (1975), 3239 or Organic Synthesis 60, (1981), 66. The reaction of the aniline IV with the dioxaspirooctanedione IX gives the carboxylic acid II. The synthesis route is shown in Scheme 5.

Scheme 5:

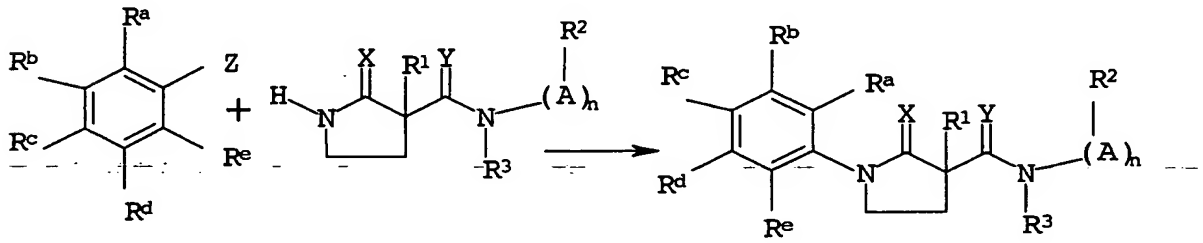


(IV) (IX) (II)

B) Linking a pyrrolidinone X to an aromatic compound XI

Compounds of the formula I can furthermore be prepared by reacting suitably substituted pyrrolidinones X with aromatic compounds of the formula XI according to the synthesis shown in Scheme 6.

Scheme 6:



(XI) (X) (I)

In Scheme 6, the variables R^a, R^b, R^c, R^d, R^d, R^e, X, Y, A, n, R^1, R^2 and R^3 are as defined above. Z is halogen, preferably fluorine, chlorine or bromine, or $B(OH)_2$, $B(OR')_2$ or $Sn(R')_3$. In these radicals, R' is aryl, such as phenyl, or C_1-C_{10}-alkyl.

The reaction is preferably carried out in a solvent, in particular a polar aprotic solvent, such as dimethylformamide, dimethyl sulfoxide, N-methylpyrrolidone, dimethylacetamide, an ether, such as diethyl ether, tetrahydrofuran or dioxane, and mixtures of these solvents.

In general, the reaction is carried out at temperatures above room temperature, preferably in the range from 50 to 200°C. To this end, the compounds of the formulae X and XI are preferably employed in approximately equimolar amounts. It is, of course, also possible to use an excess of one of the components, the excess preferably being not more than 50 mol%, in particular not more than 20 mol%, based on the component which is present in a substoichiometric amount.

The compounds I according to the invention are furthermore obtained by coupling XI (for example Z = Cl, Br, I, $B(OR)_2$, SnR_3) with a pyrrolidinone X, preferably in the presence of catalytically active amounts of a palladium, copper or nickel compound, if appropriate in the presence of a base, in an organic solvent or a mixture of a solvent with water, at room temperature or elevated temperatures. Processes for coupling

a phenylboronic acid are described, for example, in WO 02/42275.

Suitable palladium catalysts are, in addition to palladium carboxylates, such as palladium(II) acetate, also palladium/phosphine complexes, such as tetrakistriphenylphosphinepalladium, bistriphenylphosphinepalladium(II) chloride, bis(1,2-diphenylphosphinoethane)palladium(II) chloride, bis(1,3-diphenylphosphinopropane)palladium(II) chloride, bis(1,4-diphenylphosphinobutane)palladium(II) chloride and bis(diphenylphosphino)ferrocenylpalladium(II) chloride. However, it is also possible to react palladium halides such as palladium(II) chloride in situ with phosphine ligands, giving the catalytically active complexes. Suitable phosphine ligands are, for example, arylphosphines which are unsubstituted or substituted in the ortho-, meta- or para-position by halogen, alkyl and/or SO_3H, such as triphenylphosphine, 1,2-bis(diphenylphosphino)ethane, 1,3-bis(diphenylphosphino)propane, 1,4-bis(diphenylphosphino)butane, bis(diphenylphosphino)ferrocene, hetarylphosphines, such as trifurylphosphine or tripyridylphosphine.

Suitable Ni catalysts are nickel(II) acetylacetonate alone or in combination with the abovementioned phosphine ligands, or Ni(II) acetylacetonate with imidazolium carbene ligands, and also complexes of nickel(II) salts with the abovementioned phosphine ligands, for example bis(triphenylphosphine)nickel(II) chloride, [1,3-bis(diphenylphosphino)propane]nickel(II) chloride, [1,4-bis(diphenylphosphino)butane]nickel(II) chloride and [bis(diphenylphosphino)ferrocene]nickel(II) chloride.

Suitable copper compounds are, in particular, copper(I) compounds, such as CuCl, CuBr and the like.

The catalyst is usually employed in substoichiometric amounts, preferably of 0.001-0.8 equivalents and particularly preferably of 0.01 to 0.5 equivalents, based on the pyrrolidinone XI used.

If appropriate, it may be advantageous to convert the compound X initially with a base into its salt. Suitable bases are, for example, alkali metal hydrides, such as sodium hydride, and sodium alkoxides, such as sodium methoxide and sodium ethoxide, lithium amides, such as lithium

diisopropylamide, and also organolithium compounds, such as butyllithium and phenyllithium.

The molar ratio of compound XI to compound X is preferably in the range from 0.95:1 to 1:1.5.

Suitable bases are, if required, alkali metal and alkaline earth metal hydroxides, alkali metal (bi)carbonates and alkali metal phosphates, such as NaOH, $NaHCO_3$, Na_2CO_3, $KHCO_3$, K_2CO_3, $Ba(OH)_2$, K_3PO_4, alkali metal, alkaline earth metal, thallium and transition metal alkoxides, such as sodium ethoxide and thallium ethoxide. Other suitable bases are alkali metal fluorides, such as potassium fluoride, cesium fluoride, ammonium fluorides and tetrabutylammonium fluoride. The base is usually employed in an approximately stoichiometric amount or in up to 10-fold excess, based on the compound II.

Suitable solvents are organic solvents, such as DMF, dimethylacetamide, toluene, tetrahydrofuran (THF), dioxane and dimethoxyethane. If the coupling is carried out with boronic acid, the abovementioned solvents can also be employed in a mixture with water, for example in a ratio of about 5:1 to 1:5, preferably in a ratio of about 2:1 to 1:2 and in particular of about 1:1.

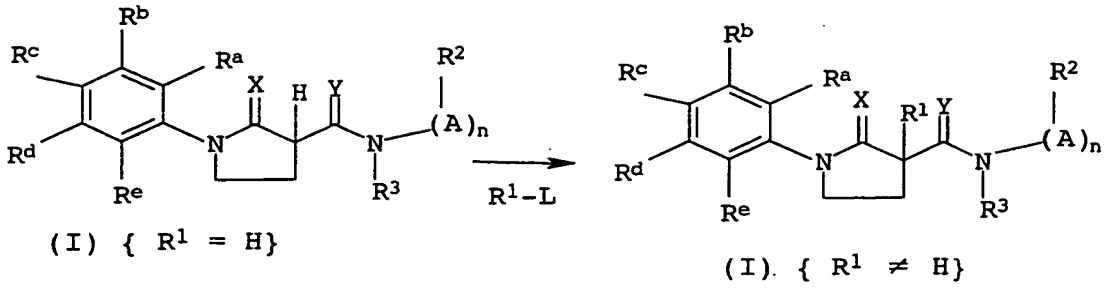
The reaction temperature is usually above the melting point and can be up to the boiling point of the solvent. It is preferably in the range between 50 and 150°C.

The pyrrolidino compounds X can be prepared by customary processes, for example analogously to the procedure described in process A.

C) Alkylation of compounds of the formula I in which R^1 = H

Compounds of the formula I in which R^1 is hydrogen can be prepared according to general methods by treatment with an alkylation agent R^1-L in compounds of the formula I in which R^1 is not hydrogen. The synthesis route is shown in Scheme 7.

Scheme 7:



In Scheme 7, the variables R^1, R^a, R^b, R^c, R^d, R^d, R^e, X, Y, A, n, R^1, R^2 and R^3 are as defined above. L is a nucleophilically displaceable leaving group, such as halogen, for example chlorine, bromine, iodine, or imidazolyl, carboxylate, such as acetate, arylsulfonate or alkylsulfonate, for example mesylate or triflate. The reaction is usually carried out in the presence of a base. Suitable bases include alkali metal or alkaline earth metal hydroxides, metal hydrides, such as alkali metal hydrides, for example sodium hydride, tertiary alkylamines, such as triethylamine, aromatic amines, such as pyridine, α-, β-, γ-lutidine, lithium diisopropylamide.

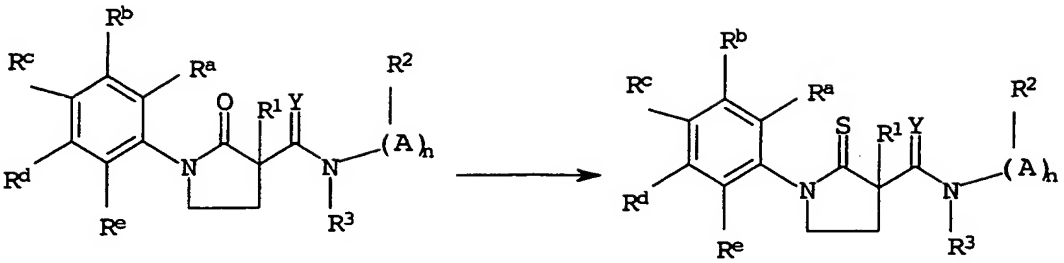
Suitable solvents are, for example, chlorinated hydrocarbons, such as methylene chloride or 1,2-dichloroethane, aromatic hydrocarbons, such as toluene, xylene or chlorobenzene, ethers, such as diethyl ether, methyl tert-butyl ether, tetrahydrofuran, dioxane, polar aprotic solvents, such as acetonitrile, dimethylformamide or dimethyl sulfoxide.

In general, the reaction temperature is in the range from 0°C to the boiling point of the reaction mixture.

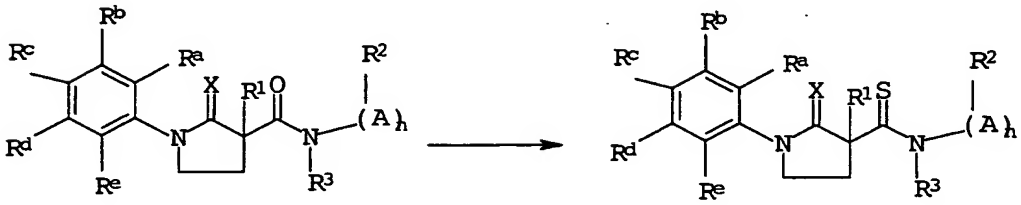
D) Sulfurization of the compounds of the formula I in which X or Y is oxygen.

Compounds of the formula I in which X or Y is oxygen can be prepared according to general methods by treatment with a sulfurizing agent in compounds of the formula I in which X or Y is sulfur. This synthesis route is illustrated in Scheme 8.

Scheme 8:



(I) {X = O} (I {X = S}



(I) {Y = O} (I) {Y = S}

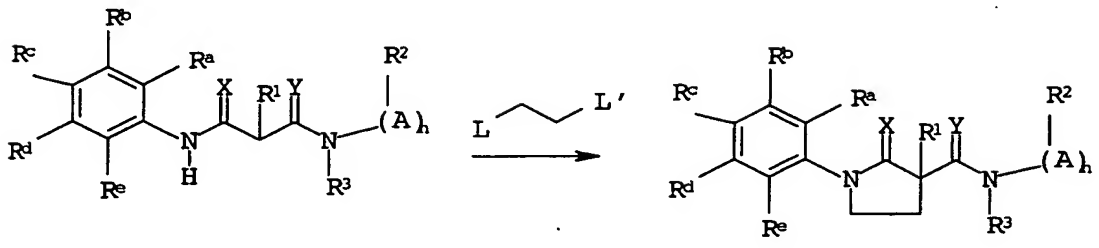
In Scheme 8, the variables R^a, R^b, R^c, R^d, R^d, R^e, X, Y, A, n, R^1, R^2 and R^3 are as defined above. Examples of suitable sulfurizing agents are phosphorus(V) sulfides, organotin sulfides, and also organophosphorus sulfides (see also J. March, Advanced Organic Synthesis, 2nd Edition, Wiley Interscience 1985, p. 794 and the literature cited therein). Particularly suitable sulfurizing agents are phosphorus(V) sulfide and 2,4-bis(4-methoxyphenyl)-1,3,2,4-dithia-diphosphetane-2,4-dithione ("Lawesson's reagent"). Sulfurization processes are described, for example, in WO 95/33718. The reaction can be carried out in a solvent or neat. Suitable solvents are all solvents which are inert under the reaction conditions, for example aromatic hydrocarbons, such as benzene, toluene, xylene, chlorobenzene, basic solvents, such as pyridine, ethers, such as diethyl ether, 1,2-dimethoxyethane or tetrahydrofuran, etc. The temperatures required for the reaction are generally above room temperature and in particular in the range of from 50°C to the boiling point of the reaction mixture.

E) Condensation of an anilide XII

A further route to the compounds I according to the invention is the reaction of an anilide XII with a suitable

difunctional compound L-CH_2-CH_2-L' with ring closure according to Scheme 9.

Scheme 9:



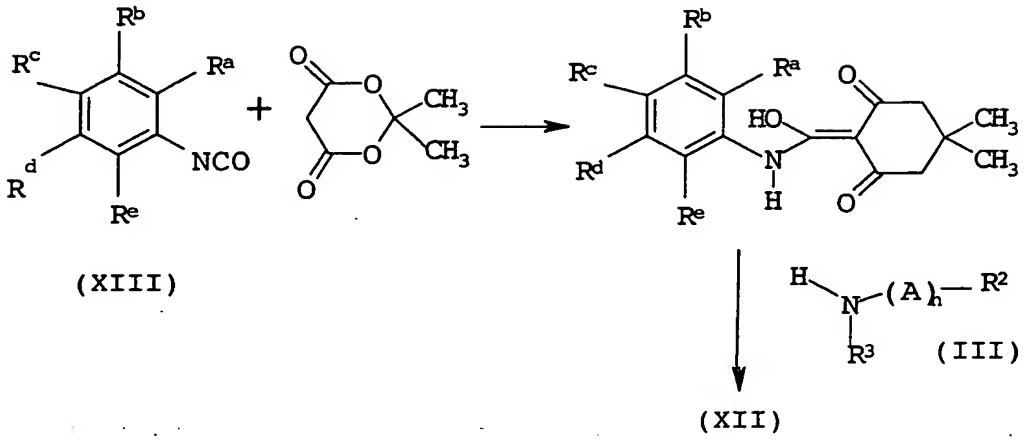
(XII) (I)

In Scheme 9, the variables R^a, R^b, R^c, R^d, R^d, R^e, X, Y, A, n, R^1, R^2 and R^3 are as defined above, L is as defined in C) and L' has the meaning of L.

The cyclization is carried out in the presence of a base. Suitable bases are all bases mentioned under C). In general, the reaction is carried out in an inert solvent. Suitable solvents are in particular chlorinated hydrocarbons, such as methylene chloride or 1,2-dichloroethane, aromatic hydrocarbons, such as toluene, xylene or chlorobenzene, ethers, such as diethyl ether, methyl tert-butyl ether, tetrahydrofuran, dioxane, polar aprotic solvents, such as acetonitrile, dimethylformamide or dimethyl sulfoxide. The starting material XII and the difunctional compound L-CH_2-CH_2-L' are expediently employed in approximately equimolar amounts; however, to optimize the conversion, it may be advantageous to use an excess of one of the two components. The reaction is generally carried out at a temperature between room temperature and the boiling point of the reaction mixture.

The starting materials XII can be prepared in two steps similarly to the process described in Synlett 12 (1969), 1209. In the first step, an isocyanate XIII is reacted with meldrum acid (2,2-dimethyl-1,3-dioxane-4,6-dione). In the second step, the resulting product is then reacted with a suitable amine III. In Scheme 10, the variables R^a, R^b, R^c, R^d, R^d, R^e, X, Y, A, n, R^1, R^2 and R^3 are as defined above.

Scheme 10



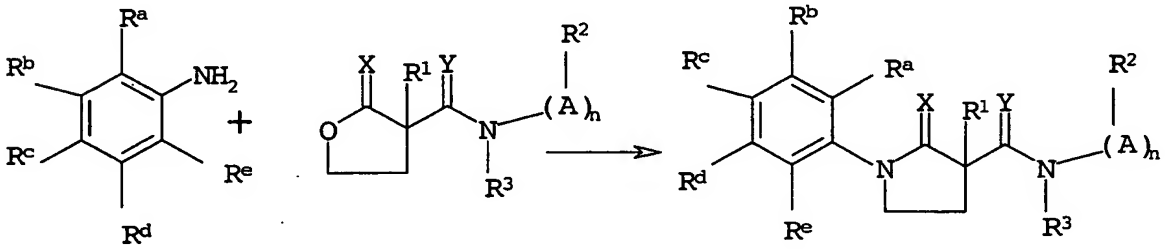
(XIII) (III) (XII)

F) Condensations

F.1 Condensation of anilines IV with tetrahydro-2-furanones XIV

The compounds I according to the invention can be prepared, for example, by condensing anilines IV with tetrahydro-2-furanones XIV according to the synthesis route shown in Scheme 11. Analogous reactions are known, for example from Tetrahedron Letters, 31 (21) (1990), 2991, and can be applied to the preparation of the compounds according to the invention.

Scheme 11:



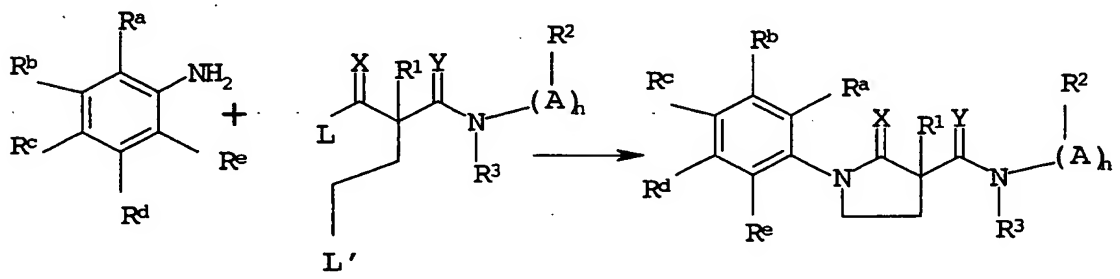
(IV) (XIV) (I)

In Scheme 11, the variables R^a, R^b, R^c, R^d, R^d, R^e, X, Y, A, n, R^1, R^2 and R^3 are as defined above. The reaction of the anilines IV is usually carried out in a carboxylic acid, such as acetic acid, at temperatures in the range from 0°C to 100°C. In general, the starting materials are employed in equimolar amounts, or one of the two components is employed in excess.

F.2 Condensation of anilines IV with carboxylic acid derivatives XV and subsequent cyclization

The compounds I according to the invention can be prepared, for example, by condensing anilines IV with carboxylic acid derivatives XV according to the synthesis route shown in Scheme 12.

Scheme 12:



(IV) (XV) (I)

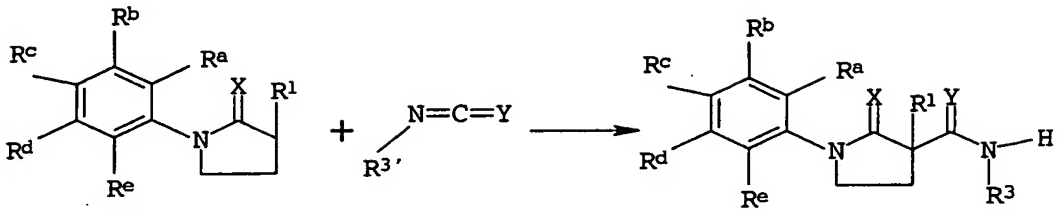
In Scheme 12, the variables R^a, R^b, R^c, R^d, R^d, R^e, X, Y, A, n, R^1, R^2 and R^3 are as defined above. L is as defined in C) and L' has the meaning of L. The reaction of the aniline IV with the carboxylic acid derivative XV is usually carried out in the presence of a base. Suitable bases are, for example, amines, such as 1,5-diazabicyclo[4.3.0]non-5-ene (DBN), 1,8-diazabicyclo[5.4.0]undec-7-ene (DBU), pyridine or triethylamine. The base is usually employed in up to six-fold excess, based on the carboxylic acid derivative XV. The reaction is generally carried out in a solvent. Suitable solvents are, for example, chlorinated hydrocarbons, such as methylene chloride, 1,2—dichloroethane, ethers, for example dialkyl ethers, such as diethyl ether, methyl tert—butyl ether, or cyclic ethers, such as tetrahydrofuran or dioxane, carbonamides, such as dimethylformamide, N-methyllactams, such as N-methylpyrrolidone, nitriles, such as acetonitrile, aromatic hydrocarbons, such as toluene, aromatic amines, such as pyridine, or mixtures of these. In general, the reaction temperature is in a range of from 0°C to the boiling point of the solvent.

G) Reaction of a pyrrolidinone XVI with an iso(thio)cyanate XVII

Compounds of the formula I can be prepared by reacting pyrrolidinones XVI with an iso(thio)cyanate XVII in the presence of a base according to the synthesis route shown in

Scheme 13. Such reactions are known, for example, from US 5,185,349.

Scheme 13:



(XVI) (XVII) (I)

In Scheme 13, the variables R^a, R^b, R^c, R^d, R^d, R^e, X, Y and R^1 are as defined above. $R^{3'}$ has the meanings mentioned for R^3 which are different from hydrogen. To prepare compounds I where R^3 = H, preference is given to using the salt of an isocyanate or isothiocyanate, for example sodium iso(thio)cyanate or potassium iso(thio)cyanate.

Suitable bases include alkali metal hydrides, such as sodium hydride or potassium hydride, organolithium compounds, such as lithium diisopropylamide. In general, the reaction is carried out in a solvent. Suitable solvents include ethers, such as diethyl ether, methyl tert-butyl ether, tetrahydrofuran, 1,4-dioxane, anisole, glycol ethers, such as dimethyl glycol ether, hydrocarbons, such as hexane, petroleum ether or mixtures of these.

The compounds I and their agriculturally useful salts are suitable - both as isomer mixtures and in the form of the pure isomers - as herbicides. The herbicidal compositions comprising I permit very good control of plant growth on uncultivated areas. In crops such as wheat, rice, corn, soybean and cotton, they are effective against broad-leaved weeds and harmful grasses without significantly damaging the crops. This effect occurs in particular at low application rates.

Depending on the particular application method, the compounds I or the herbicidal compositions comprising them may be used in a further number of crops for eliminating unwanted plants. Suitable are, for example, the following crops:

Allium cepa, Ananas comosus, Arachis hypogaea, Asparagus officinalis, Beta vulgaris spec. altissima, Beta vulgaris spec. rapa, Brassica napus var. napus, Brassica napus var. napobrassica, Brassica rapa var. silvestris, Camellia sinensis,

Carthamus tinctorius, Carya illinoinensis, Citrus limon, Citrus sinensis, Coffea arabica (Coffea canephora, Coffea liberica), Cucumis sativus, Cynodon dactylon, Daucus carota, Elaeis guineensis, Fragaria vesca, Glycine max, Gossypium hirsutum, (Gossypium arboreum, Gossypium herbaceum, Gossypium vitifolium), Helianthus annuus, Hevea brasiliensis, Hordeum vulgare, Humulus lupulus, Ipomoea batatas, Juglans regia, Lens culinaris, Linum usitatissimum, Lycopersicon lycopersicum, Malus spec., Manihot esculenta, Medicago sativa, Musa spec., Nicotiana tabacum (N.rustica), Olea europaea, Oryza sativa, Phaseolus lunatus, Phaseolus vulgaris, Picea abies, Pinus spec., Pisum sativum, Prunus avium, Prunus persica, Pyrus communis, Ribes sylvestre, Ricinus communis, Saccharum officinarum, Secale cereale, Solanum tuberosum, Sorghum bicolor (S. vulgare), Theobroma cacao, Trifolium pratense, Triticum aestivum, Triticum durum, Vicia faba, Vitis vinifera and Zea mays.

The compounds I may also be used in crops which are tolerant to the action of herbicides as a result of breeding, including the use of genetic engineering methods.

The compounds I or the herbicidal compositions comprising them can be used, for example, in the form of directly sprayable aqueous solutions, powders, suspensions, including highly concentrated aqueous, oily or other suspensions or dispersions, emulsions, oil dispersions, pastes, dusting agents, broadcasting agents or granules, by spraying, nebulizing, dusting, broadcasting or pouring, or for seed dressing or mixing with the seed. The application forms depend on the intended uses; they should in any case ensure very fine distribution of the active ingredients according to the invention.

The herbicidal compositions comprise a herbicidally effective amount of at least one active compound of the formula I and auxiliaries which are usually used in formulating crop protection agents.

Suitable inert auxiliaries are essentially:
mineral oil fractions having a medium to high boiling point, such as kerosine and diesel oil, and coal tar oils and oils of vegetable or animal origin, aliphatic, cyclic and aromatic hydrocarbons, for example paraffins, tetrahydronaphthalene, alkylated naphthalenes and derivatives thereof, alkylated benzenes and derivatives thereof, alcohols, such as methanol, ethanol, propanol, butanol and cyclohexanol, ketones, such as

cyclohexanone, and strongly polar solvents, for example amines, such as N-methylpyrrolidone, and water.

Aqueous application forms can be prepared from emulsion concentrates, from suspensions, pastes, wettable powders or water-dispersible granules by adding water. For the preparation of emulsions, pastes or oil dispersions, the 1-phenylpyrrolidin-2-onecarboxamides I, as such or dissolved in an oil or solvent, can be homogenized in water by means of wetting agents, adherents, dispersants or emulsifiers. However, it is also possible to prepare concentrates which consist of active ingredient, wetting agent, adherent, dispersant or emulsifier and possibly solvent or oil, which are suitable for dilution with water.

Suitable surfactants are the alkali metal, alkaline earth metal and ammonium salts of aromatic sulfonic acids, e.g. lignin-, phenol-, naphthalene- and dibutylnaphthalenesulfonic acid, and of fatty acids, alkylsulfonates and alkylarylsulfonates, alkyl sulfates, lauryl ether sulfates and fatty alcohol sulfates, and salts of sulfated hexa-, hepta- and octadecanols and of fatty alcohol glycol ethers, condensates of sulfonated naphthalene and its derivatives with formaldehyde, condensates of naphthalene or of naphthalenesulfonic acids with phenol and formaldehyde, polyoxyethylene octylphenol ether, ethoxylated isooctyl-, octyl- or nonylphenol, alkylphenyl polyglycol ether, tributylphenyl polyglycol ether, alkylaryl polyether alcohols, isotridecyl alcohol, fatty alcohol/ethylene oxide condensates, ethoxylated castor oil, polyoxyethylene alkyl ethers or polyoxypropylene alkyl ethers, lauryl alcohol polyglycol ether acetate, sorbitol esters, lignosulfite waste liquors and methylcellulose.

Powders, broadcasting agents and dusting agents can be prepared by mixing or milling the active ingredients together with a solid carrier.

Granules, for example coated, impregnated and homogeneous granules, can be prepared by binding the active ingredients to solid carriers. Solid carriers are mineral earths, such as silicas, silica gels, silicates, talc, kaolin, limestone, lime, chalk, bole, loess, clay, dolomite, diatomaceous earth, calcium sulfate, magnesium sulfate, magnesium oxide, milled plastics, fertilizers, such as ammonium sulfate, ammonium phosphate, ammonium nitrate and ureas, and vegetable products, such as grain flour, bark meal, wood meal and nutshell meal, cellulosic powders and other solid carriers.

The concentrations of the active ingredients I in the ready-to-use formulations may be varied within wide ranges. In general, the formulations comprise from about 0.001 to 98, preferably from 0.01 to 95, % by weight of at least one active ingredient I. The active ingredients are used in a purity of from 90 to 100 %, preferably from 95 to 100 % (according to the NMR spectrum).

The compounds I according to the invention can be formulated, for example, as follows:

I. 20 parts by weight of a compound I are dissolved in a mixture which consists of 80 parts by weight of alkylated benzene, 10 parts by weight of the adduct of from 8 to 10 mol of ethylene oxide with 1 mol of N-monoethanololeamide, 5 parts by weight of the calcium salt of dodecylbenzenesulfonic acid and 5 parts by weight of the adduct of 40 mol of ethylene oxide with 1 mol of castor oil. By pouring the solution into 100,000 parts by weight of water and finely distributing it therein, an aqueous dispersion which comprises 0.02% by weight of the active ingredient is obtained.

II. 20 parts by weight of a compound I are dissolved in a mixture which consists of 40 parts by weight of cyclohexanone, 30 parts by weight of isobutanol, 20 parts by weight of the adduct of 7 mol of ethylene oxide with 1 mol of isooctylphenol and 10 parts by weight of the adduct of 40 mol of ethylene oxide with 1 mol of castor oil. By pouring the solution into 100,000 parts by weight of water and finely distributing it therein, an aqueous dispersion which comprises 0.02% by weight of the active ingredient is obtained.

III. 20 parts by weight of a compound I are dissolved in a mixture which consists of 25 parts by weight of cyclohexanone, 65 parts by weight of a mineral oil fraction boiling within the range from 210 to 280°C and 10 parts by weight of the adduct of 40 mol of ethylene oxide with 1 mol of castor oil. By pouring the solution into 100,000 parts by weight of water and finely distributing it therein, an aqueous dispersion which comprises 0.02% by weight of the active ingredient is obtained.

IV. 20 parts by weight of a compound I are thoroughly mixed with 3 parts by weight of the sodium salt of diisobutylnaphthalene-α-sulfonic acid, 17 parts by weight

of the sodium salt of a lignosulfonic acid obtained from a sulfite waste liquor and 60 parts by weight of silica gel powder, and the mixture is milled in a hammer mill. By finely distributing the mixture in 20,000 parts by weight of water, a spray liquor which comprises 0.1% by weight of the active ingredient is obtained.

V. 3 parts by weight of a compound I are mixed with 97 parts by weight of finely divided kaolin. A dusting agent which comprises 3% by weight of the active ingredient is obtained in this manner.

VI. 20 parts by weight of a compound I are thoroughly mixed with 2 parts by weight of the calcium salt of dodecylbenzenesulfonic acid, 8 parts by weight of fatty alcohol polyglycol ether, 2 parts by weight of sodium salt of a phenol/urea/formaldehyde condensate and 68 parts by weight of a paraffinic mineral oil. A stable oily dispersion is obtained.

VII. 1 part by weight of a compound I is dissolved in a mixture which consists of 70 parts by weight of cyclohexanone, 20 parts by weight of ethoxylated isooctylphenol and 10 parts by weight of ethoxylated castor oil. A stable emulsion concentrate is obtained.

VIII. 1 part by weight of a compound I is dissolved in a mixture which consists of 80 parts by weight of cyclohexanone and 20 parts by weight of Wettol® EM31 (= nonionic emulsifier based on ethoxylated castor oil; BASF AG). A stable emulsion concentrate is obtained.

The active compounds I or the herbicidal compositions can be applied by the preemergence or postemergence method. The herbicidal compositions or active compounds can also be applied by sowing crop seed which has been pretreated with the herbicidal compositions or active compounds. If the active ingredients are less well tolerated by certain crops, it is possible to use application methods in which the herbicidal compositions are sprayed with the aid of the sprayers in such a way that the leaves of the sensitive crops are as far as possible not affected, while the active compounds reach the leaves of undesirable plants growing underneath or the uncovered soil surface (post-directed, lay-by).

The application rates of active compound I are from 0.001 to 3.0, preferably from 0.01 to 1.0, kg/ha of active ingredient (a.i.),

depending on the aim of control, the season, the target plants and the state of growth.

In order to broaden the action spectrum and to achieve synergistic effects, the compounds I according to the invention may be mixed with many members of other groups of herbicidal or growth-regulating active ingredients and applied together with them.

Examples of suitable components of the mixture are 1,2,4-thiadiazoles, 1,3,4-thiadiazoles, amides, aminophosphoric acid and derivatives thereof, aminotriazoles, anilides, aryloxy-/hetaryloxyalkanoic acids and derivatives thereof, benzoic acid and derivatives thereof, benzothiadiazinones, 2-(hetaroyl/aroyl)-1,3-cyclohexanediones, hetarylarylketones, benzylisoxazolidinones, meta-CF_3-phenyl derivatives, carbamates, quinolinecarboxylic acid and derivatives thereof, chloroacetanilides, cyclohexane-1,3-dione derivatives, diazines, dichloropropionic acid and derivatives thereof, dihydrobenzofurans, dihydrofuran-3-ones, dinitroanilines, dinitrophenols, diphenyl ethers, dipyridyls, halocarboxylic acids and derivatives thereof, ureas, 3-phenyluracils, imidazoles, imidazolinones, N-phenyl-3,4,5,6-tetrahydrophthalimides, oxadiazoles, oxiranes, phenols, aryloxy- and heteroaryloxyphenoxypropionic esters, phenylacetic acid and derivatives thereof, 2-phenylpropionic acid and derivatives thereof, pyrazoles, phenylpyrazoles, pyridazines, pyridinecarboxylic acid and derivatives thereof, pyrimidyl ethers, sulfonamides, sulfonylureas, triazines, triazinones, triazolinones, triazolcarboxamides and uracils.

It may also be useful to apply the compounds I together, alone or in combination with other herbicides, also as a mixture with further crop-protection agents, for example with pesticides or agents for controlling phytopathogenic fungi or bacteria. The miscibility with mineral salt solutions which are used for eliminating nutrient and trace element deficiencies is also of interest. Nonphytotoxic oils and oil concentrates can also be added.

The examples below are intended to illustrate the invention without limiting it.

Preparation examples

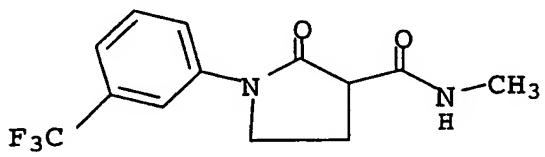
The products were characterized by HPLC/MS (high performance liquid chromatography/mass spectrometry), by ^{1}H-NMR spectroscopy or by their melting point.

HPLC column: RP-18 column (Chromolith Speed ROD from Merck KgaA, Germany).

Mobile phase: acetonitrile + 0.1% trifluoroacetic acid (TFA)/water + 0.1% TFA in a gradient from 5:95 to 95:5 over 5 minutes, at 40°C.

MS: quadrupole electrospray ionization, 80 V (positive mode)

Example 1: 1-(3-trifluoromethyl)phenyl-3-(N-methyl)carboxamido-2-pyrrolidinone



1.1: 1-(3-trifluoromethyl)phenyl-2-pyrrolidinone

54 g (0.34 mol) of 3-trifluoromethylaniline, 110 ml of butyrolactone and 5 ml of concentrated hydrochloric acid were heated at reflux for 13 hours. Excess butyrolactone was then removed under reduced pressure. The resulting crystalline residue was washed initially with an aqueous sodium bicarbonate solution and then with water and subsequently with pentane. Drying gave 65.5 g (85% of theory) of 1-(3-trifluoromethyl)phenyl-2-pyrrolidinone.
^{1}H-NMR (270 MHz, $CDCl_3$) δ (ppm): 7.85 (m, 2H), 7.45 (t, 1H), 7.4 (d, 1H), 3.85 (t, 2H), 2.6 (t, 2H), 2.2 (qu, 2H).

1.2: 2-oxo-1-(3-trifluoromethyl)phenyl-3-pyrrolidinecarboxylic acid

Under nitrogen, 50 ml of absolute tetrahydrofuran were added to 13.6 g (0.06 mol) of 1-(3-trifluoromethyl)phenyl-2-pyrrolidinone from 1.1, the mixture was cooled to 0°C and 60 ml of 2M (0.12 mol) lithium diisoproylamide in a solvent mixture of heptane, tetrahydrofuran and ethylbenzene were added. The reaction mixture was stirred at 0°C for 45 minutes. 5.4 g (0.06 mol) of dimethyl

carbonate in 10 ml of absolute tetrahydrofuran were then added. After the addition had ended, the reaction mixture was allowed to warm to 20°C and stirred for another 72 hours. The solvent was evaporated under reduced pressure and methyl tert-butyl ether and water were then added to the resulting residue, the phases were separated and the organic phase was extracted twice with water. The aqueous phase was acidified with hydrochloric acid (10% by weight) to pH = 1. The mixture was extracted twice with in each case 100 ml of ethyl acetate and the combined organic phase was dried and concentrated under reduced pressure. This gave 5.61 g (34% of theory) of 2-oxo-1-(3-trifluoromethyl)phenyl-3-pyrrolidinecarboxylic acid of melting point 121°C.
^{1}H-NMR (400 MHz, $CDCl_3$) δ (ppm): 7.9 (s, 1H), 7.8 (d, 1H), 7.5 (t, 1H), 7.45 (d, 1H), 4.1 – 3.9 (m, 2H), 3.7 (t, 1H), 2.55 (m, 2H).

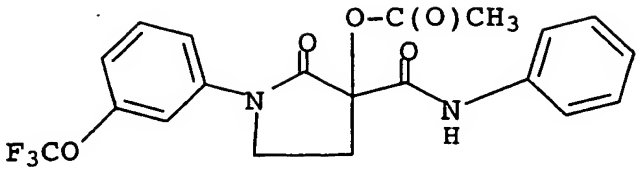
1.3: 1-(3-trifluoromethyl)phenyl-3-(N-methyl)carboxamido-2-pyrrolidinone

0.14 g (1.8 mmol) of a 40% strength aqueous methylamine solution was added to 0.5 g (1.8 mmol) of 2-oxo-1-(3-trifluoromethyl)-phenyl-3-pyrrolidinecarboxylic acid from 1.2 in 50 ml of dichloromethane and 0.35 g (2 mmol) of 1,1'-carbonyldiimidazole. The reaction mixture was stirred at room temperature for 18 hours. The reaction mixture was extracted with saturated aqueous ammonium chloride solution and the organic phase was then extracted with water. The organic phase was dried over anhydrous sodium sulfate, the solvent was removed under reduced pressure and the residue that remained was then titrated with methyl tert-butyl ether. The insoluble fraction was then separated off, and the residue was washed with methyl tert-butyl ether. This gave 0.166 g (32% of theory) of the title compound of melting point 128°C.

^{1}H-NMR (400 MHz, $CDCl_3$) δ (ppm): 7.9 (s, 1H), 7.75 (d, 1H), 7.5 (t, 1H), 7.4 (d, 1H), 7.3 – 7.2 (br, 1H), 4.0 – 3.8 (m, 2H), 3.5 (t, 1H), 2.9 (d, 3H), 2.75 – 2.6 (m, 1H), 2.55 – 2.45 (m, 1H).

Example 2:

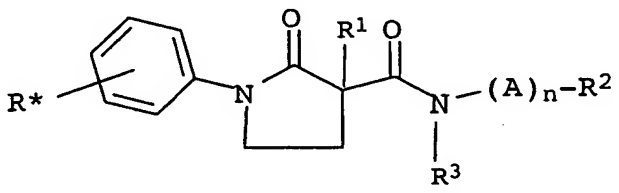
1-(3-trifluoromethoxy)phenyl-3-acetyloxy-3-(N-phenyl)carboxamido-2-pyrrolidinone



0.34 g (0.93 mmol) of 1-(3-trifluoromethoxy)phenyl-3-(N-phenyl)-carboxamido-2-pyrrolidinone, prepared analogously to Example 1 using the starting material 3-trifluoromethoxyaniline, was initially charged in 3 ml of dry dimethylformamide (DMF), and 0.04 g (0.093 mmol) of sodium hydride (60% in mineral oil) was added at 20°C. The mixture was then stirred at 20°C for 30 min, 0.07 g (0.093 mmol) of acetyl chloride was then added and the mixture was stirred at 20°C for another 18 h. Water was added and the mixture was extracted repeatedly with dichloromethane. The combined organic phases were washed with water, the solvent was removed and the residue was chromatographed. This gave 0.27 g of the title compound of melting point 140°C.

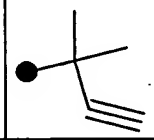
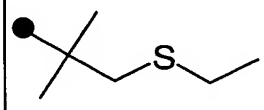
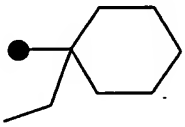
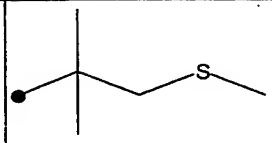
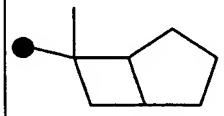
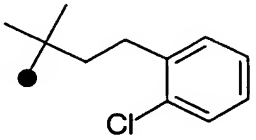
The compounds of Examples 3 to 191 were prepared in an analogous manner:

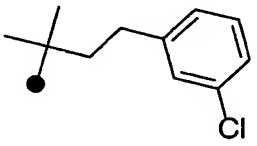
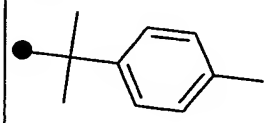
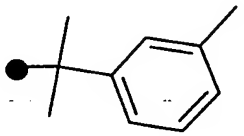
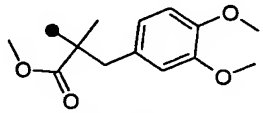
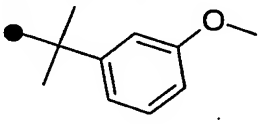
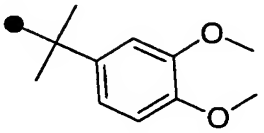
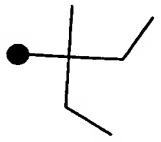
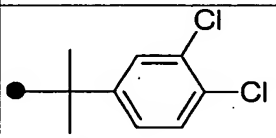
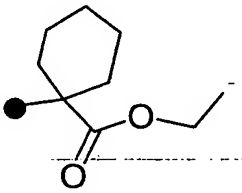
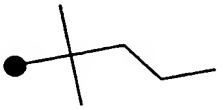
Table 2:

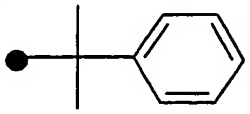
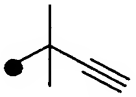
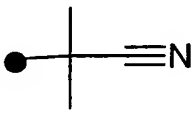
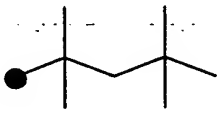
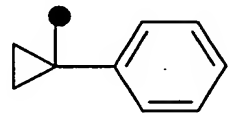
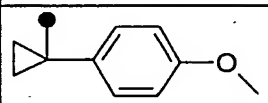
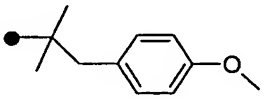
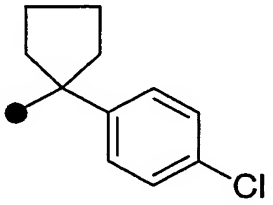
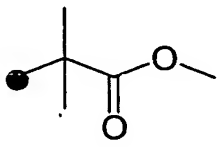
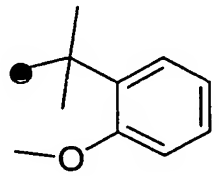
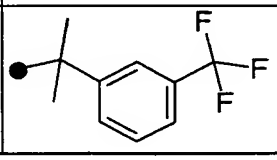


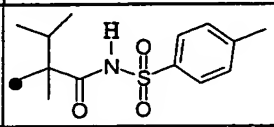
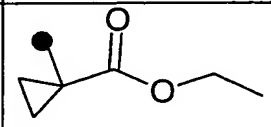
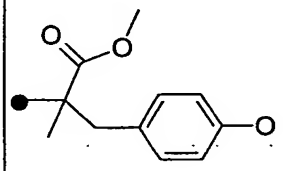
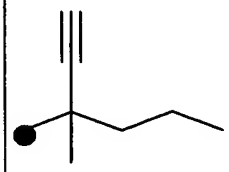
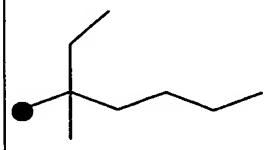
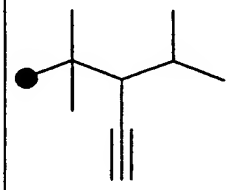
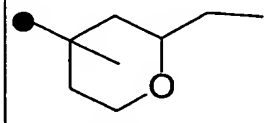
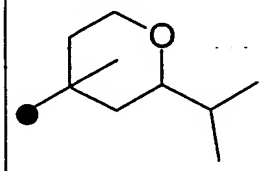
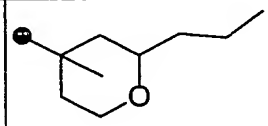
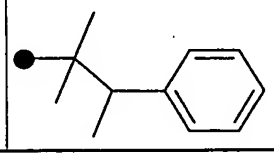
Example	$(A)_n$	R*	R^1	R^2	R^3	m.p. [°C] or RT (HPLC/MS)
1	-	3-CF_3	H	methyl	H	128
2	-	3-OCF_3	$OC(O)CH_3$	phenyl	H	140
3	-	3-CF_3	H	ethyl	H	122
4	-	3-CF_3	H	n-propyl	H	112
5	-	3-CF_3	H	n-butyl	H	111
6	-	3-CF_3	H	tert-butyl	H	oil
7	-	3-CF_3	H	cyclopentyl	H	oil
8	-	3-CF_3	H	ethyl	ethyl	oil
9	-	3-CF_3	H	methyl	n-butyl	oil

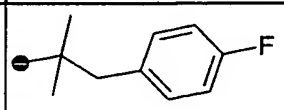
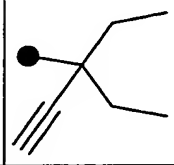
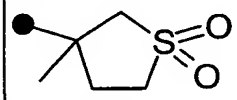
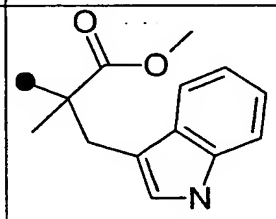
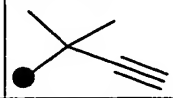
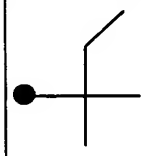
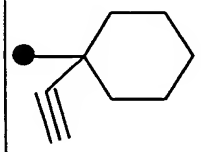
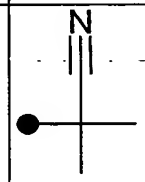
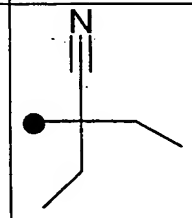
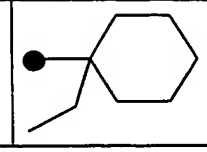
Example	$(A)_n$	R*	R^1	R^2	R^3	m.p. [°C] or RT (HPLC/MS)
10	-	3-CF_3	H	phenyl	H	oil
11	-	3-CF_3	H	$CH(CH_3)_2$	H	136
12	-	3-CF_3	H	cyclohexyl	H	141
13	-	3-CF_3	H	CH_2-cyclopropyl	H	108
14	-	3-CF_3	H	cyclopropyl	H	oil
15	-	3-CF_3	H	methyl	methyl	oil
16	-	3-CF_3	H	cyclopropyl	methyl	oil
17	O	3-CF_3	H	t-butyl	H	122
18	-	3-OCF_3	H	methyl	H	103
19	-	3-OCF_3	H	ethyl	H	111
20	-	3-OCF_3	H	n-propyl	H	110
21	-	3-OCF_3	H	tert-butyl	H	89
22	-	3-OCF_3	H	cyclopentyl	H	140
23	-	3-OCF_3	H	methyl	n-butyl	oil
24	-	3-OCF_3	H	phenyl	H	108
25	-	3-OCF_3	H	$CH(CH_3)_2$	H	134
26	-	3-OCF_3	H	cyclopropyl	H	134
27	-	3-OCF_3	H	methyl	methyl	oil
28	-	3-OCF_3	H	H	H	106
29	O	3-OCF_3	H	H	H	124
30	-	3-OCF_3	$OC(O)CH_3$	cyclopentyl	H	oil
31	O	3-OCF_3	H	methyl	H	98
32	-	3-OCF_3	CH_3	tert-butyl	H	40
33	O	3-OCF_3	H	CH_2-phenyl	H	108
34	O	3-OCF_3	H	methyl	methyl	oil
35	O	3-OCF_3	H	$CH(CH_3)_2$	H	123
36	O	3-OCF_3	H	$CH_2CH=CH_2$	H	75
37	O	3-OCF_3	H	$CH_2C(Cl)=CH_2$	H	68
38	O	3-OCF_3	H	$CH_2CH_2CH_2$		29
39	O	3-OCF_3	H	$CH_2CH=CHCH_3$	H	87
40	O	3-OCF_3	H	$CH_2CH=CHCl$	H	62
41	O	3-OCF_3	H	CH_2CH_3	H	100
42	O	3-OCF_3	H	$CH_2CH_2OCH_3$	H	85
43	O	3-OCF_3	H	cylohexyl	H	152
44	O	3-OCF_3	H	CH_2-cylohexyl	H	135
45	-	3-$CH(CH_3)_2$	H	tert-butyl	H	51
46	-	3-$CH(CH_3)_2$	CH_3	tert-butyl	H	78
47	O	3-CF_3	H	tert-butyl	H	oil

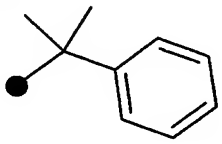
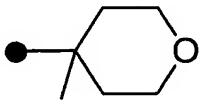
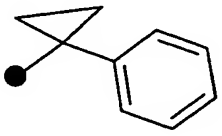
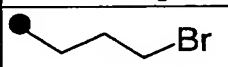
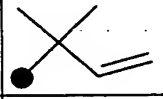
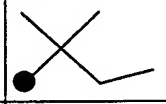
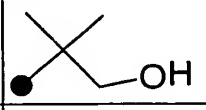
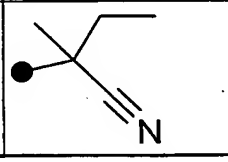
Example	$(A)_n$	R*	R^1	R^2	R^3	m.p. [°C] or RT (HPLC/MS)
48	O	3-OCF_3	H	tert-butyl	H	112
49	-	2-Cl	H	tert-butyl	H	76
50	-	3-Cl	H	tert-butyl	H	118
51	-	3-Cl; 5-Cl	H	tert-butyl	H	130
52	-	2-Cl; 4-Cl	H	tert-butyl	H	93
53	-	2-F	H	tert-butyl	H	113
54	-	2-CF_3	H	tert-butyl	H	90
55	-	4-CF_3	H	tert-butyl	H	155
56	-	2-CH_3	H	tert-butyl	H	93
57	-	3-CH_3	H	tert-butyl	H	88
58	-	4-CH_3	H	tert-butyl	H	135
59	-	2-$CH(CH_3)_2$	H	tert-butyl	H	104
60	-	3-OCH_3	H	tert-butyl	H	43
61	-	4-OCH_3	H	tert-butyl	H	132
62	-	2-OCH_3	H	tert-butyl	H	oil
63	-	2-Cl; 6-Cl	H	tert-butyl	H	oil
64	-	2-Cl; 3-Cl	H	tert-butyl	H	oil
65	-	4-Cl	H	tert-butyl	H	155
66	-	3-OCH_3	H		H	110-112
67	-	3-OCF_3	H		H	3.78 min, m/z = 405 $[M+H]^+$
68	-	3-OCF_3	H		H	4.09 min m/z = 399 $[M+H]^+$
69	-	3-OCF_3	H		H	3.62 min m/z = 391 $[M+H]^+$
70	-	3-OCF_3	H		H	3.89 min m/z = 397 $[M+H]^+$
71	-	3-OCF_3	H		H	4.30 min m/z = 469 $[M+H]^+$

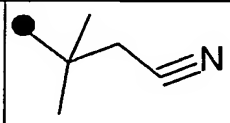
Example	$(A)_n$	R*	R^1	R^2	R^3	m.p. [°C] or RT (HPLC/MS)
72	-	3-OCF_3	H		H	4.03 min m/z = 469 $[M+H]^+$
73	-	3-OCF_3	H		H	3.95 min m/z = 443 $[M+Na]^+$
74	-	3-OCF_3	H		H	3.93 min m/z = 443 $[M+Na]^+$
75	-	3-OCF_3	H		H	3.61 min m/z = 525 $[M+H]^+$
76	-	3-OCF_3	H		H	3.75 min m/z = 459 $[M+Na]^+$
77	-	3-OCF_3	H		H	3.55 min m/z = 489 $[M+Na]^+$
78	-	3-OCF_3	H		H	3.84 min m/z = 373 $[M+H]^+$
79	-	3-OCF_3	H		H	4.11 min m/z = 498 $[M+Na]^+$
80	-	3-OCF_3	H		H	3.79 min m/z = 443 $[M+H]^+$
81	-	3-OCF_3	H		H	3.88 min m/z = 373 $[M+H]^+$
82	-	3-OCF_3	H		H	3.60 min m/z = 387 $[M+H]^+$

Example	$(A)_n$	R*	R^1	R^2	R^3	m.p. [°C] or RT (HPLC/MS)
83	-	3-OCF_3	H		H	3.80 min m/z = 429 $[M+Na]^+$
84	-	3-OCF_3	H		H	3.37 min m/z = 355 $[M+H]^+$
85	-	3-OCF_3	H		H	3.17 min m/z = 356 $[M+H]^+$
86	-	3-OCF_3	H		H	4.20 min m/z = 401 $[M+H]^+$
87	-	3-OCF_3	H		H	3.55 min m/z = 405 $[M+H]^+$
88	-	3-OCF_3	H		H	3.52 min m/z = 435 $[M+H]^+$
89	-	3-OCF_3	H		H	3.91 min m/z = 451 $[M+H]^+$
90	-	3-OCF_3	H		H	4.20 min m/z = 491 $[M+Na]^+$
91	-	3-OCF_3	H		H	3.18 min m/z = 389 $[M+H]^+$
92	-	3-OCF_3	H		H	3.85 min m/z = 460 $[M+Na]^+$
93	-	3-OCF_3	H		H	4.03 min m/z = 475 $[M+H]^+$

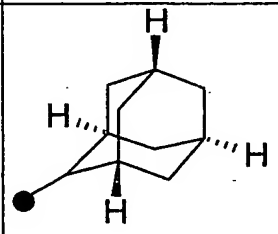
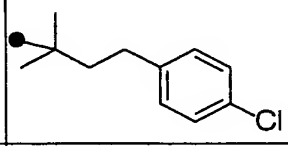
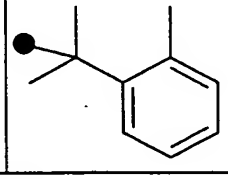
Example	$(A)_n$	R*	R^1	R^2	R^3	m.p. [°C] or RT (HPLC/MS)
94	-	3-OCF_3	H		H	3.82 min m/z = 579 $[M+Na]^+$
95	-	3-OCF_3	H		H	3.19 min m/z = 401 $[M+H]^+$
96	-	3-OCF_3	H		H	3.32 min m/z = 481 $[M+H]^+$
97	-	3-OCF_3	H		H	3.75 min m/z = 383 $[M+H]^+$
98	-	3-OCF_3	H		H	4.26 min m/z = 401 $[M+H]^+$
99	-	3-OCF_3	H		H	4.06 min m/z = 411 $[M+H]^+$
100	-	3-OCF_3	H		H	3.54 min m/z = 415 $[M+H]^+$
101	-	3-OCF_3	H		H	3.79 min m/z = 429 $[M+H]^+$
102	-	3-OCF_3	H		H	3.77 min m/z = 429 $[M+H]^+$
103	-	3-OCF_3	H		H	4.09 min m/z = 435 $[M+H]^+$

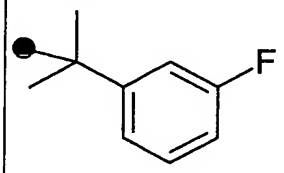
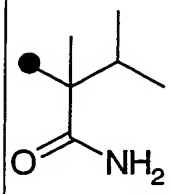
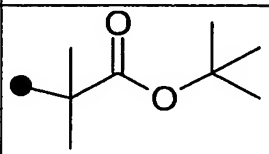
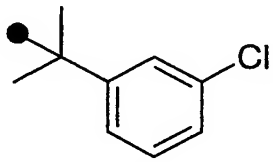
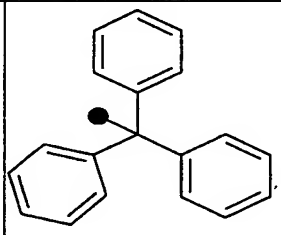
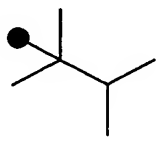
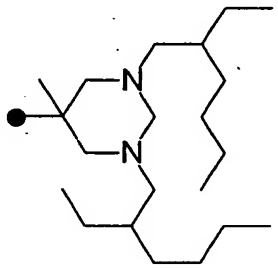
Example	$(A)_n$	R*	R^1	R^2	R^3	m.p. [°C] or RT (HPLC/MS)
104	-	3-OCF_3	H		H	3.98 min m/z = 439 $[M+H]^+$
105	-	3-OCF_3	H		H	3.75 min m/z = 383 $[M+H]^+$
106	-	3-OCF_3	H		H	2.93 min m/z = 421 $[M+H]^+$
107	-	3-OCF_3	H		H	3.63 min m/z = 504 $[M+H]^+$
108	-	3-$OCHF_2$	H	phenyl	H	104
109	-	3-$OCHF_2$	H		H	80
110	-	3-$OCHF_2$	H	tert-butyl	H	64
111	-	3-$OCHF_2$	H		H	oil
112	-	3-$OCHF_2$	H		H	153
113	-	3-$OCHF_2$	H		H	oil
114	-	3-$OCHF_2$	H		H	oil
115	-	3-$OCHF_2$	H		H	48

Example	$(A)_n$	R*	R^1	R^2	R^3	m.p. [°C] or RT (HPLC/MS)
116	-	3-$OCHF_2$	H		H	oil
117	-	3-$OCHF_2$	H		H	82
118	-	3-$OCHF_2$	H		H	oil
119	-	3-$OCHF_2$	H	CH_3	H	74
120	-	3-$OCHF_2$	H	ethyl	H	70
121	-	3-$OCHF_2$	H	isopropyl	H	126
122	-	3-$OCHF_2$	H	cylopropyl	H	130
123	-	4-$CH=C(Cl)_2$	H	tert-butyl	H	166-167
124	-	3-CF_3; 5-CF_3	H	tert-butyl	H	135-136
125	-	4-SCH_3	H	tert-butyl	H	166-167
126	-	4-$CH(CH_3)_2$	H	tert-butyl	H	130-131
127	-	4-$OCHF_2$	H	tert-butyl	H	152-153
128	-	3-Cl; 4-Cl; 5-Cl	H	tert-butyl	H	160-163
129	-	3-Br; 5-Br	H	tert-butyl	H	140-141
130	-	4-NO_2; 5-Cl	H	tert-butyl	H	152-153
131	-	4-OCF_2CF_3	H	tert-butyl	H	66-67
132	-	3-OCF_3	H		H	oil
133	-	3-OCF_3	H		H	3.51 min m/z = 357 $[M+H]^+$
134	-	3-OCF_3	H		H	3.67 min m/z = 359 $[M+H]^+$
135	-	3-OCF_3	H		H	2.92 min m/z = 361 $[M+H]^+$
136	-	3-OCF_3	H		H	3.31 min m/z = 370 $[M+H]^+$

Example	$(A)_n$	R*	R^1	R^2	R^3	m.p. [°C] or RT (HPLC/MS)
137	-	3-OCF_3	H		H	3.23 min m/z = 370 [M+H]+
138	-	3-CF_3; 4-Cl	H	tert-butyl	H	3.65 min m/z = 363 $[M+H]^+$
139	-	3-OCH_3; 5-OCH_3	H	tert-butyl	H	2.87 min m/z = 321 $[M+H]^+$
140	-	3-SCH_3	H	tert-butyl	H	3.14 min m/z = 307 $[M+H]^+$
141	-	3-tert-butyl	H	tert-butyl	H	3.62 min m/z = 317 [M+H]+
142	-	O-$CH(CH_3)_2$	H	tert-butyl	H	3.24 min m/z = 319 [M+H]+
143	-	3-F; 4-F	H	tert-butyl	H	3.07 min m/z = 297 $[M+H]^+$
144	-	3-OCH_3; 4-OCH_3; 5-OCH_3	H	tert-butyl	H	2.64 min m/z = 351 $[M+H]^+$
145	-	4-propyl	H	tert-butyl	H	3.53 min m/z = 303 $[M+H]^+$
146	-	4-O-tert-butyl	H	tert-butyl	H	3.36 min m/z = 333 $[M+H]^+$
147	-	3-Cl; 4-F	H	tert-butyl	H	3.26 min m/z = 313 [M+H]+
148	-	4-O-propyl	H	tert-butyl	H	3.67 min m/z = 319 $[M+H]^+$
149	-	4-Br	H	tert-butyl	H	3.19 min m/z = 339 $[M+H]^+$
150	-	4-SCH_2CH_3	H	tert-butyl	H	3.32 min m/z = 321 $[M+H]^+$
151	-	3-Br; 4-OCH_3; 5-Cl	H	tert-butyl	H	3.49 min m/z = 405 $[M+H]^+$
152	-	3-Cl; 4-O-propyl	H	tert-butyl	H	3.58 min m/z = 353 $[M+H]^+$

Example	$(A)_n$	R*	R^1	R^2	R^3	m.p. [°C] or RT (HPLC/MS)
153	-	3-F; 4-NO_2	H	tert-butyl	H	2.97 min m/z = 324 $[M+H]^+$
154	-	3-Br; 5-Br; 4-Cl	H	tert-butyl	H	3.86 min m/z = 452 $[M+H]^+$
155	-	3-ethyl; 5-CH_3	H	tert-butyl	H	3.47 min m/z = 303 $[M]^+$
156	-	3-CH_3; 5-CH_3	H	tert-butyl	H	3.22 min m/z = 289 $[M+H]^+$
157	-	3-Br	H	tert-butyl	H	3.21 min m/z = 341 $[M+H]^+$
158	-	3-ethyl	H	tert-butyl	H	3.23 min m/z = 289 $[M+H]^+$
159	-	3-iso-propyl; 4-OCH_3	H	tert-butyl	H	3.46 min m/z = 333 [M+H]+
160	-	3,4 -OCH_2CH_2O-	H	tert-butyl	H	2.66 min m/z = 319 $[M+H]^+$
161	-	4-CN	H	tert-butyl	H	2.74 min m/z = 286 $[M+H]^+$
162	-	3-CN; 4-OCH_3	H	tert-butyl	H	2.74 min m/z = 316 $[M+H]^+$
163	-	3-CN; 4-F	H	tert-butyl	H	2.79 min m/z = 304 $[M+H]^+$
164	-	3-F; 4-CH_3	H	tert-butyl	H	3.22 min m/z = 293 $[M+H]^+$
165	-	3-CN; 4-Cl	H	tert-butyl	H	3.09 min m/z = 320 $[M+H]^+$
166	-	3-Cl; 4-Cl	H	tert-butyl	H	3.53 min m/z = 329 $[M]^+$
167	-	3-CH_3; 4-F	H	tert-butyl	H	3.11 min m/z = 293 $[M+H]^+$
168	-	3-Cl; 4-OCH_3	H	tert-butyl	H	3.06 min m/z = 325 $[M+H]^+$

Example	$(A)_n$	R*	R^1	R^2	R^3	m.p. [°C] or RT (HPLC/MS)
169	-	4-heptyl	H	tert-butyl	H	4.50 min m/z = 359 $[M+H]^+$
170	-	4-tert-butyl	H	tert-butyl	H	3.73 min m/z = 317 $[M+H]^+$
171	-	4-ethyl	H	tert-butyl	H	3.32 min m/z = 289 $[M+H]^+$
172	-	3-Cl; 4-iso-propyl	H	tert-butyl	H	3.82 min m/z = 337 $[M+H]^+$
173	-	3-Cl; 4-CH_3	H	tert-butyl	H	3.45 min m/z = 309 $[M]^+$
174	-	3-F	H	tert-butyl	H	3.96 min m/z = 279 $[M+H]^+$
175	-	3-CH_3; 5-propyl	H	tert-butyl	H	94-96
176	-	3-ethyl; 5-ethyl	H	tert-butyl	H	120-122
177	-	3-O-ethyl	H	tert-butyl	H	86-88
178	-	3-OCH_3; 4-Br	H	tert-butyl	H	150-152
179	-	3-OCH_3; 4-Cl	H	tert-butyl	H	137-139
180	-	3-Cl; 4-SCF_3	H	tert-butyl	H	3.86 min m/z = 395 $[M+H]^+$
181	-	4-F	H	tert-butyl	H	2.77 min m/z = 278 $[M+H]^+$
182	-	3-OCF_3	H		H	4.16 min m/z = 423 $[M+H]^+$
183	-	3-OCF_3	H		H	4.31 min m/z = 469 $[M+H]^+$
184		3-OCF_3	H		H	3.87 min m/z = 443 $[M+H]^+$

Example	$(A)_n$	R*	R^1	R^2	R^3	m.p. [°C] or RT (HPLC/MS)
185	-	3-OCF_3	H		H	3.76 min m/z = 447 $[M+Na]^+$
186	-	3-OCF_3	H		H	3.00 min m/z = 402 $[M+H]^+$
187	-	3-OCF_3	H		H	3.75 min m/z = 453 $[M+Na]^+$
188	-	3-OCF_3	H		H	3.94 min m/z = 463 $[M+Na]^+$
189	-	3-OCF_3	H		H	4.42 min m/z = 553 $[M+Na]^+$
190	-	3-OCF_3	H		H	3.85 min m/z = 473 $[M+Na]^+$
191	-	3-OCF_3	H		H	4.49 min m/z = 611 $[M+Na]^+$

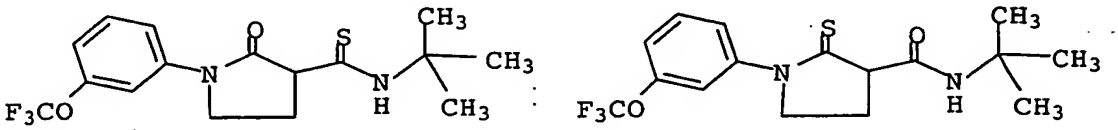
* The number in front of the substituent denotes the position of the substituent on the phenyl ring.

• Attachment site

RT = retention time, HPLC/MS
m.p. = melting point
phenyl = C_6H_5

Example 192:

1-(3-trifluoromethoxy)phenyl-3-(N-(1,1-dimethylethyl))carboxamido-2-pyrrolidinethione and 1-(3-trifluoromethoxy)phenyl-3-(N-(1,1-dimethylethyl))thiocarboxamido-2-pyrrolidinone



0.26 g (0.7 mmol) of 1-(3-trifluoromethoxy)phenyl-3- (N-(1,1-dimethylethyl))carboxamido-2-pyrrolidinone was initially charged in 3 ml of dry toluene, and 0.17 g (0.42 mmol) of 2,4-bis(4-methoxyphenyl)-1,3-dithia-2,4-diphosphetane-2,4- dithione (Lawesson's reagent) was added at 20°C, and the mixture was heated at 70°C for 7 h. The reaction mixture was then washed twice with water. The solvent was removed and the residue was chromatographed on silica gel using a mixture of cyclohexane/ethyl acetate as mobile phase. A first fraction gave 0.06 g (22%) of 1-(3-trifluoromethoxy)phenyl-3-(N-(1,1-dimethylethyl))thiocarboxamido-2-pyrrolidinone of melting point 65°C and 0.08 g (29%) of 1-(3-trifluoromethoxy)phenyl-3-(N-(1,1-dimethylethyl))carboxamido-2-pyrrolidinethione of melting point 116°C.

Use examples

The herbicidal activity of the 1-phenylpyrrolidon-2-one-3-carboxamides of the formula I was demonstrated by the following greenhouse experiments:

The cultivation containers used were plastic flowerpots containing loamy sand with approximately 3.0% of humus as the substrate. The seeds of the test plants were sown separately for each species.

For the preemergence treatment, directly after sowing the active compounds, which had been suspended or emulsified in water, were applied by means of finely distributing nozzles. The containers

were irrigated gently to promote germination and growth and subsequently covered with transparent plastic hoods until the plants had rooted. This cover causes uniform germination of the test plants, unless this was adversely affected by the active compounds.

For the postemergence treatment, the test plants were first grown to a height of 3-15 cm, depending on the plant habit, and only then treated with the active compounds which had been suspended or emulsified in water. The test plants were for this purpose either sown directly and grown in the same containers, or they were first grown separately as seedlings and transplanted into the test containers a few days prior to the treatment. The application rate for the pre- and postemergence treatment was 3.0 kg of a.i./ha.

Depending on the species, the plants were kept at 10 - 25°C or 20 - 35°C. The test period extended over 2 to 4 weeks. During this time, the plants were tended, and their response to the individual treatments was evaluated.

Evaluation was carried out using a scale from 0 to 100. 100 means no emergence of the plants, or complete destruction of at least the above-ground parts, and 0 means no damage, or normal course of growth.

The plants used in the greenhouse experiments were of the following species:

Bayer code	Common name
ABUTH	Velvetleaf
AVEFA	wild Oat
LOLMU	italien Ryegrass
SETIT	Millet
SINAL	velvetleaf

At application rates of 3 kg/ha, the compound from Example 3, applied by the post-emergence method, shows very good herbicidal activity against AVEFA and SINAL.

At application rates of 3 kg/ha, the compound from Example 18, applied by the post-emergence method, shows very good herbicidal activity against ABUTH, SETIT and SINAL.

At application rates of 3 kg/ha, the compound from Example 18, applied by the pre-emergence method, shows very good herbicidal activity against ABUTH, SETIT and SINAL.

At application rates of 3 kg/ha, the compound from Example 19, applied by the pre-emergence method, shows very good herbicidal activity against ABUTH and SINAL.

At application rates of 3 kg/ha, the compound from Example 26, applied by the post-emergence method, shows very good herbicidal activity against AVEFA and SINAL.

At application rates of 3 kg/ha, the compound from Example 26, applied by the pre-emergence method, shows very good herbicidal activity against ABUTH, LOLMU and SINAL.